

THE JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES

EDITED AND PUBLISHED BY
RUSH SHIPPEN HUIDEKOPER, Veterinarian (Alfort),
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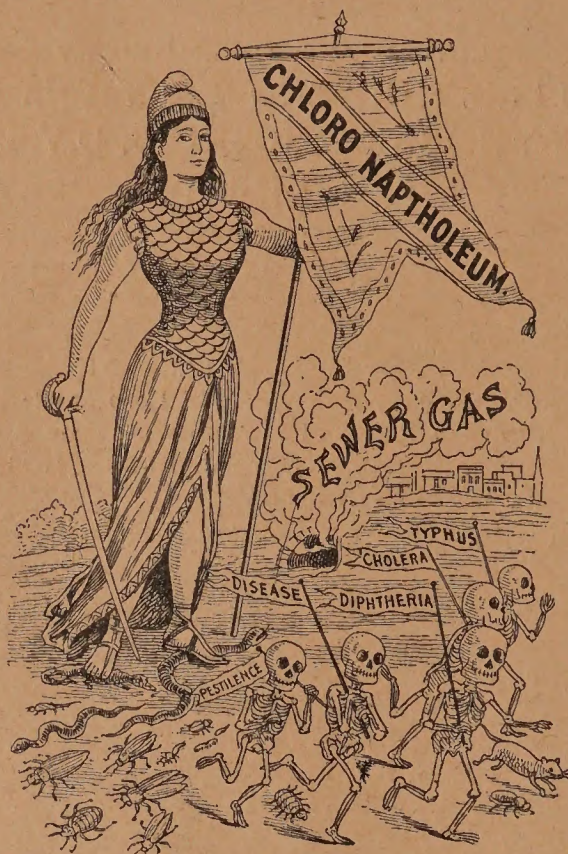
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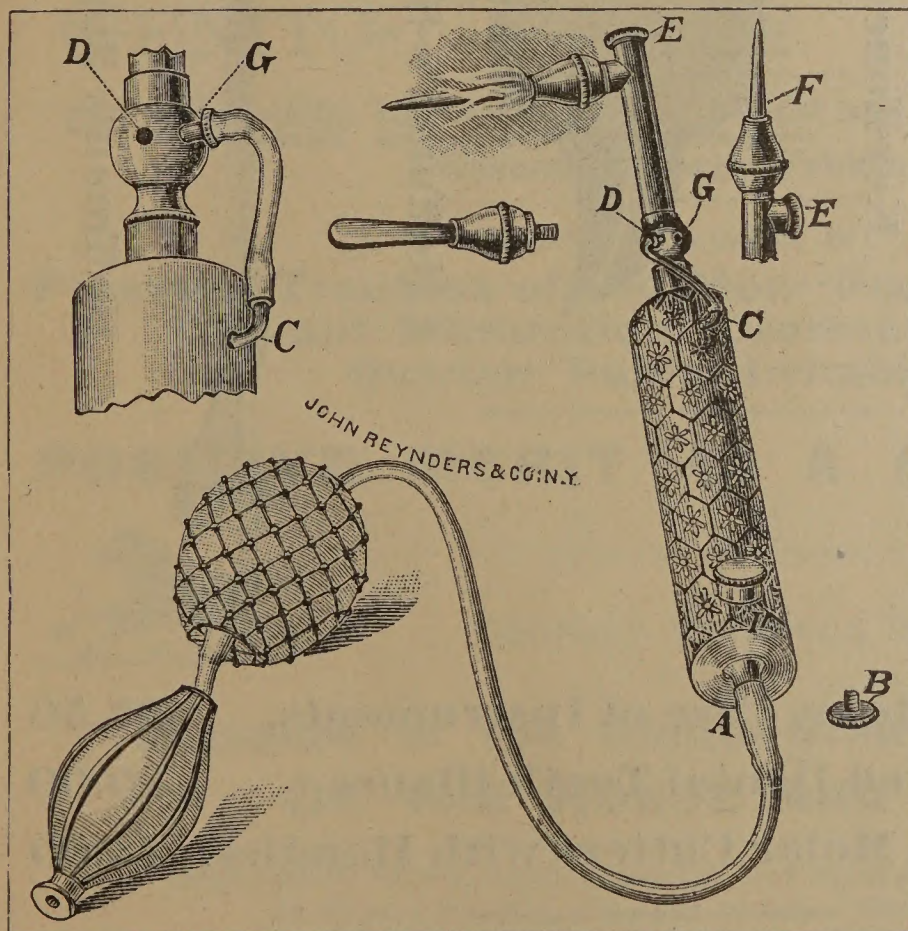
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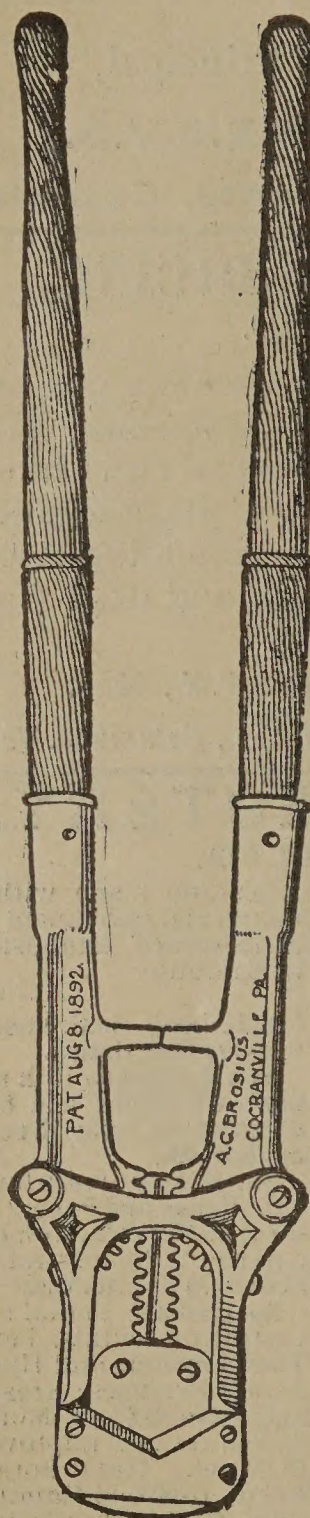
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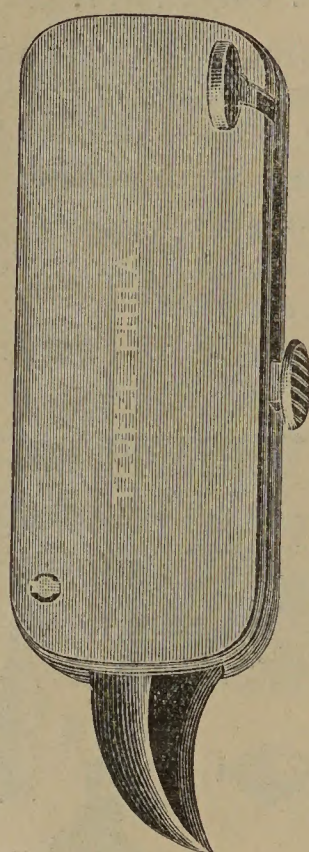
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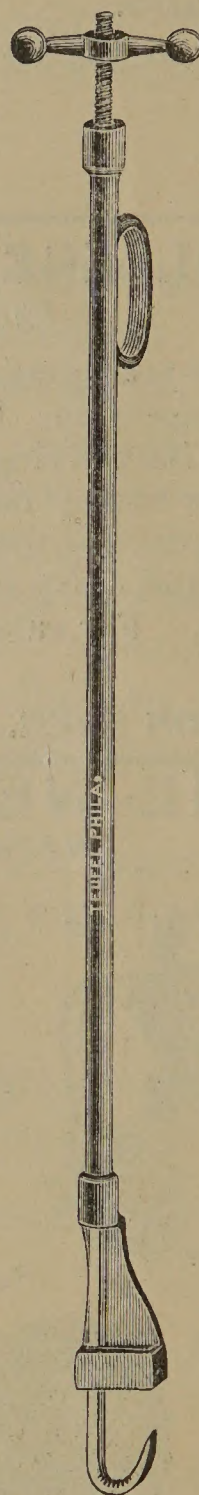
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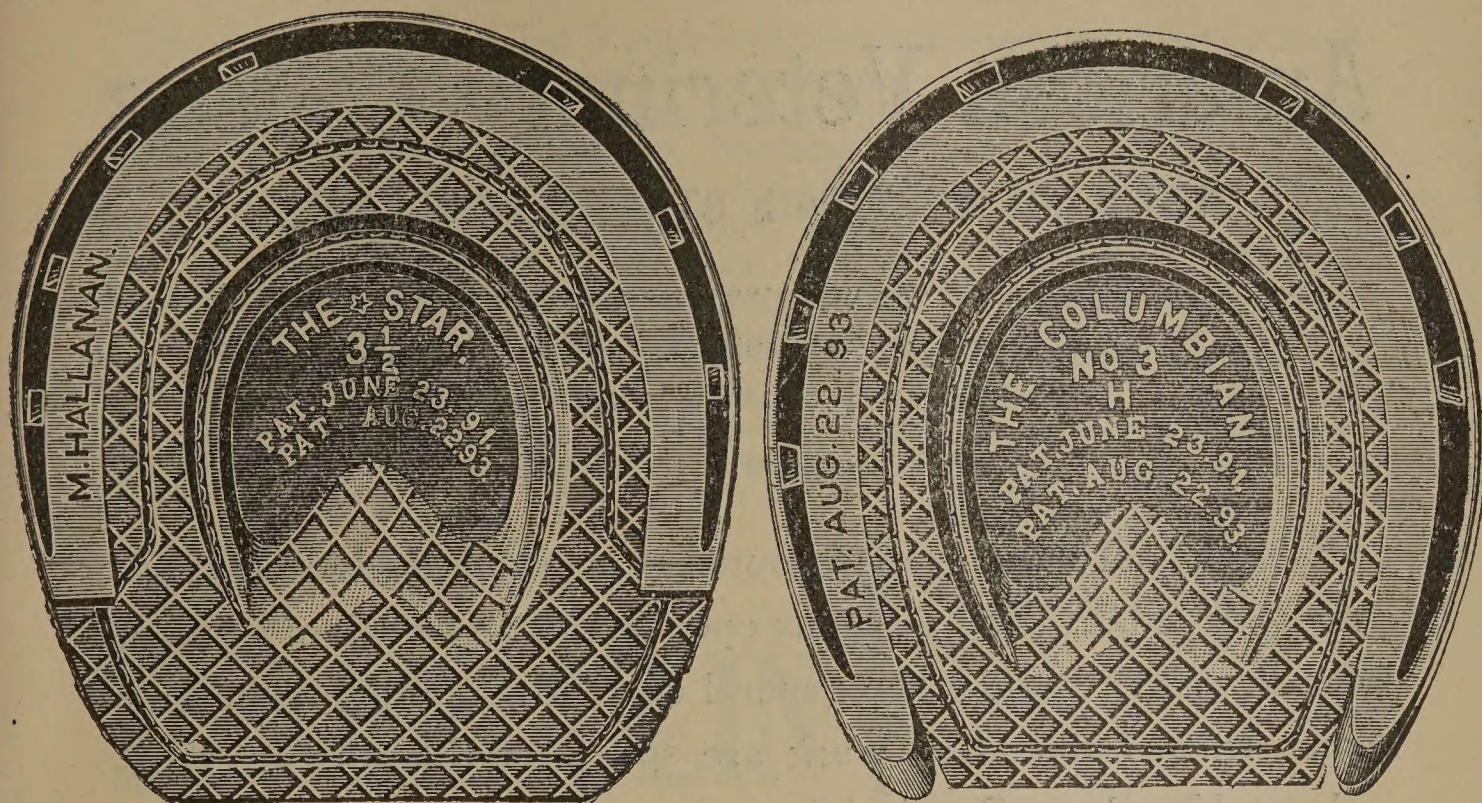
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THE JOURNAL

OF

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SEPTEMBER, 1897.

No. 9.

THE TYPHOID SERUM-DIAGNOSIS.*

BY H. L. BOLLEY, M.S.,

DEPARTMENT OF BOTANY AND ZOÖLOGY, NORTH DAKOTA AGRICULTURAL COLLEGE.

IN May, 1896, Dr. R. Pfeiffer¹ wrote as follows: "In zahlreichen Arbeiter habe ich den Nachweis geführt dass in dem Blute der gegen Cholera und Typhus immunisierten Menschen und Tiere spezifisches Schutzstoffe entstehen" und "Während unter dem Einfluss dieser Antikörper die Cholera und Typhusbacillen im Tier organismen einer rapiden Auflösung anheimfallen." In these statements there is indicated some of the most interesting physiological features of these minute plants. At the same time there is given a concise statement of the bases of the present theory of immunity.

During the past four years bacteriological literature is almost occupied by the various studied phases of this subject, and the amount of original investigation recorded in French and German alone is astonishingly extensive. While the separate discoveries are not flashed upon the world with the marked brilliancy and popularity of an x-ray, yet the growth is piece by piece and connectedly coördinate, and it may be doubted that any other field of work has ever, in like time, been as productive of benefits to mankind. Among the workers are Behring, Yersin, Loeffler, Gruber, Achard, Pfuhl, Kolle, Stern, Pfeiffer, and Widal. Simply a list of their labors would constitute a bibliography so long as to be tiresome. But from them all it grows each day more sure that medicine, surgery, hygiene, and sanitation are soon to be lifted upon a plane of exact science, raised there through labors more exacting and abstruse in detail than the world at large can appreciate.

* Presented to the Section of Botany of the American Association of Agricultural Colleges and Experiment Stations, Minneapolis Meeting, July, 1897.

A late acquisition of knowledge is found in the facts at the basis of the so-called serum-diagnosis. If all living bacteriologists were alone accredited with but the unearthing of the facts embodied in the two quotations from Pfeiffer, it could but be agreed that the world would be much their debtor; for, as science is superior in thought to practice, so is human life superior to all other considerations.

In July, 1896, at a meeting of the Société Médicale, Widal² cited a short method of diagnosing typhoid fever by observing the clearing action of blood-serum upon a living bouillon-culture of *B. typhi-abdominalis*. Later³ (see *La Semaine Médicale*, October, 1896, p. 410) he simplified the method so that a rapid microscopical diagnosis became possible. This was recognized as being of the utmost importance, and the literature of the subject is already so extensive that this note, except, perhaps, for some individual features of observation, seems almost superfluous. The work, also, at first sight, seems hardly botanical, but the physiology of this parasitically inclined saphrophyte is accountable for the characteristics of the disease and for the features of immunity, and of itself is none the less within the field of plant-activity, instructive and interesting.

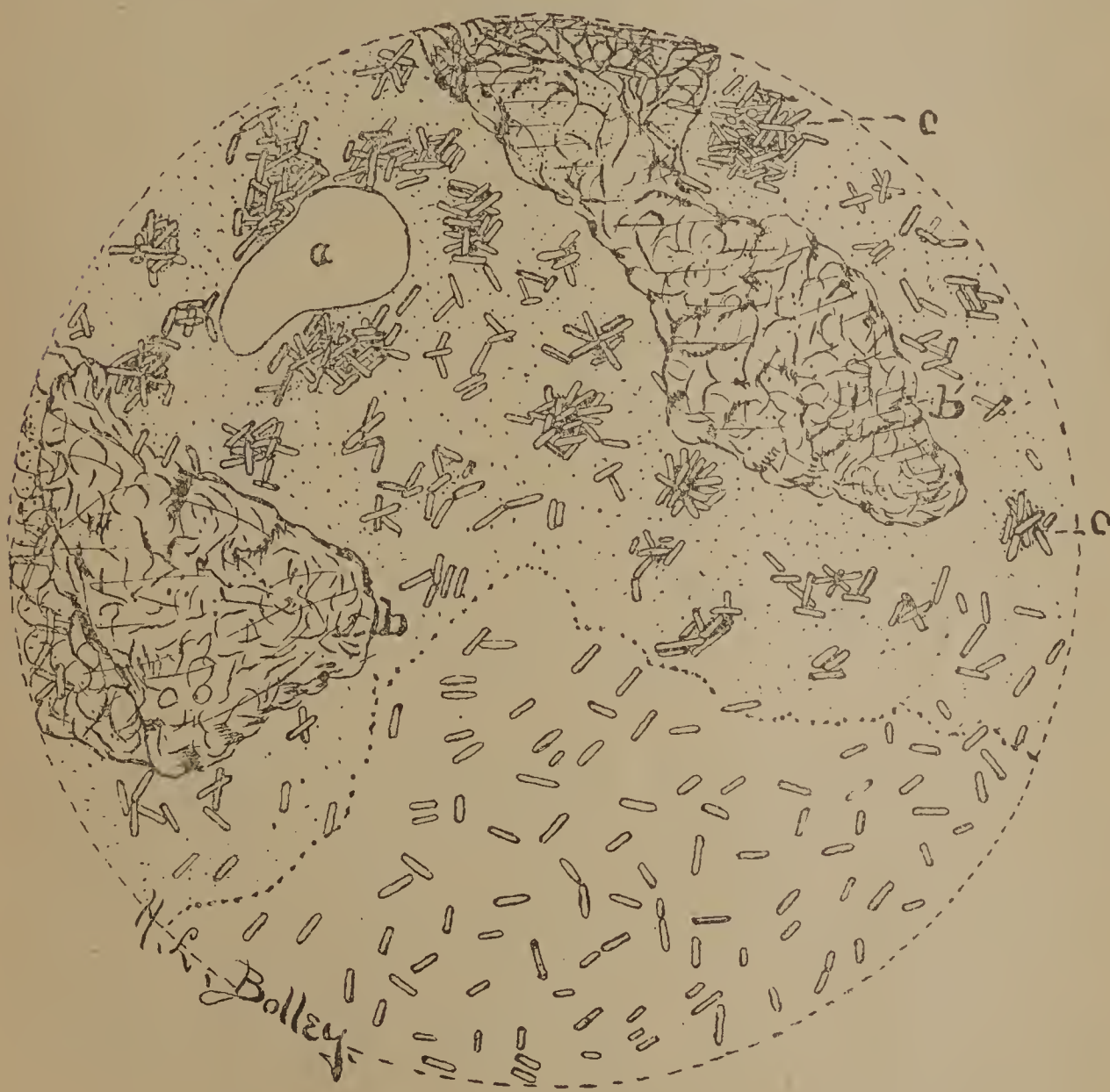
The Widal test is conducted in various ways, but in all cases depends upon the effects of typhoid-affected serum upon the specific bacilli; and, for those who have been fortunate enough to do comparative work upon this subject, it seems to me that the bugbear of bacteriological transformation of species must be forever relegated. It becomes evident that *B. abdominalis* is *B. abdominalis*, and *B. coli communis* is *B. coli communis*, etc. If to a living culture of either of these bacilli blood-serum is added from a patient sick of either, the reaction is specific only for the one causing the illness. In essential, the reaction consists in an almost immediate active clearing of the culture due to the paralysis and clumping "agglutination"—"zusammenballen," or "haufchenbildung" of the previously free-swimming bacilli. This may be studied in an ordinary microscopical manner by the hanging-drop method, and presents some interesting features for chemico-botanical studies, besides allowing for an instant diagnosis for the disease which doctors have always been compelled to allow to run too long upon surmises based upon supposed typical clinical features.

It is not in place to give a *résumé* of the work pro and con on the effectiveness of the test. The work of Pfeiffer and Kolle⁴ is alone sufficient to show its value against all apparent exceptions. My own work has also been sufficient to allow me to feel assured

that a skilled bacteriologist and microscopist need seldom, if ever, fail upon typical cases. Complications of disease are not part of this question.

ORIGINAL WORK. During the past winter and spring I have conducted studies upon four phases of this subject: first, characteristic effects of typhoid-serum upon the bacilli; second, variations in condition, as affecting the reaction; third, the use of the reaction in water-analysis; fourth, the source of reaction-serum for the last purpose.

The accompanying drawing representing a microscopic field will show at a glance the idea of a typical reaction by the dry-blood



method. Every worker must find for himself the way in which he can be accurate. My method of diagnosis has been a modification of the hanging-drop method. Three drops of blood have been so placed upon the glass slip as to make raised prominences upon which the cover-glass rested, the drop of bouillon-culture

(twenty-four to forty-eight hours old) filling the remaining space; *b* and *b'* in the drawing represent patches of such blood-masses. As the active inhibitory substance within the blood-serum penetrates the liquid which surrounds the blood-blotches, as shown by the stippled area of the drawing, a peculiar influence dominates the action of each bacillus as it is seen to swim into the field of serum. Often they strike it with an apparent shock, slow up and become irregular in their course, revolve a few times about one end, as though stuck to something slimy, then lie paralyzed. Others swimming along more evenly and forcibly strike upon the still body of another bacillus, as though attracted to it, and are then stranded there like driftwood. The result is a speedy clearing of the field from free-swimming germs (compare the upper and lower halves of the drawing) and a clumping of completely paralyzed ones as seen at *c*. In case of intense reaction, bacilli swim into the field of serum-influence, stop as though by a shock, spin around on the centre of their axes with great rapidity, and then are immediately stilled. To me, though quite beyond words, nothing can be much more specific than a typical reaction, if observation is made from the beginning. The constant occurrence of the fever in Fargo has allowed me a sufficient number of cases for verification. In nineteen clinically well-marked cases first studied, eleven gave positive results, two were doubtfully weak but afterward reacted well, five failed and the early convalescence seemed to confirm the tests, one failed, though the patient remained very ill. The reaction with *B. coli communis* for this case, though not very emphatic, was yet quite paralyzing in its effects; hence, here was a case in real doubt.

The modifications of this direct diagnosis by the microscope are various, but it is shown by Pfeiffer and Kolle to be liable to deceptive errors. The method most in use by German investigators is accomplished by drawing from five to ten cubic centimetres of blood from the patient, then allowing the serum to settle out. The serum is applied to the bouillon-culture in bulk, using about one part to ten of the culture. The culture in the test-tube gradually clears in from six to eight hours, and the bacilli are then found to be precipitated in small clumps, "kugelchen" or "haufchen." Pfeiffer⁵, however, contends that the most delicate and reliable test consists in making interabdominal injections of sero-cultural mixture. Twenty minutes after such an injection it is found that the bacilli in the interabdominal fluids have undergone "Auflosung." This is beyond the work of ordinary investigators, but is of great

interest, in this connection, in the wonderful activity indicated in the rapid dissolution of the organisms.

As in the action of all natural law, the reaction is found by different observers to vary greatly according to conditions ; hence many chances for error arise, and there is much opportunity for side investigations. Among the features which have come under my own observation are those of virulence and attenuation, age of the culture, liquid condition of the culture, acidity or alkalinity of the culture, and the age and condition of the blood-serum. Observed results upon these features are confirmatory of those made by many others. Each of these features, varied from what may be termed the normal results in some variation of the reaction ; thus, I failed to get the reaction upon a culture direct from the spleen of a guinea-pig, except in the most marked cases, while an old culture attenuated through many transfers was found very delicate under the same conditions. The culture must, of course, be in a motile condition to give the results characteristic of the hanging-drop, inasmuch as the attendant effects upon the movement of individual germs and certain features of the clumping is dependent upon this condition. This demands a liquid culture, for the power of free swimming is developed only in such. The age of the culture is important for less obvious reasons, though loss of the characteristic motion of the free-swimming bacilli is here also the most evident and confusing feature. Bacilli from a liquid culture several days old seem also to have acquired a sort of immunity to the paralyzing action of the serum, and lie in a semi-motile condition many minutes in the strongest type of serum, complete paralysis not occurring as in the active fresh cultures. This would be easily explained could it be proved that the substance formed by them in culture is identical to that which is formed by them in the animal body. Pfeiffer,⁶ however, claims that the protective substance formed is not a chemical unity, but that, at least, two different substances are formed through the direct incorporation of the body-substance of the bacilli.

I obtained negative results with cultures grown in Parietti's bouillon, potato-broth, and in other acid cultures, but positive reactions with neutral or properly alkaline bouillons. No reason is, as yet, assignable, but Cantani,⁷ in conformity to the observation of many others, that immune blood is alkaline, has shown in the case of diphtheria that the alkalescence is considerably increased during the production of artificial immunity, even after the first injection. This point alone seems sufficient to cause one to believe that alka-

lescence is essential to the action of the protective substance against the bacilli; hence the necessity for the alkaline basis for the Widal test-reaction.

The temperature condition under which the bacilli have been grown has no effect, except that the ageing of the culture occurs more rapidly under the effects of oven-culture than in room temperature. Jes⁸ has recently published similar comparative results. The germs may also be killed by heat without losing the agglutinating power, provided the temperature does not exceed 57° to 60° C. for twenty to thirty minutes. The power also persists in bacilli dead through the fumes of formalin,⁹ a feature which is further indicated in the longer-known fact that proper injection of the dead bodies of bacilli results in the production of immunity.¹⁰

A point of great value in the diagnosis by use of the microscope is the persistence with which dried blood-serum retains the inhibitory, paralyzing, and agglutinating powers. Thus, for four weeks, I made daily use of one small, dried mass of typhoid blood. This sample retained its power to the last. Other samples less positive from the first, quite rapidly diminished in agglutinating power. I have, however, had good results from blood-drops dried upon the glass slide for three months.

A feature, which yet remains clouded only because insufficient time has elapsed since Widal's discovery, is that arising to form the question of the duration of immunity. Though not properly within the field of this paper, it may be said that the time-test may be made with certainty only upon persons who have previously given the reaction or upon those now giving positive results due to past sickness. The negative results so far reported might only indicate that clinical diagnoses of years ago were in error. However, I notice that the blood of a typical case markedly active at convalescence, six months since the convalescence seems less quick. Further, cases of long standing (six months to three years) seem slower and less clean-cut in the paralyzing and clumping processes. Widal has reported cases of seven years' standing since convalescence, and Uhlenhuth¹¹ records one each for periods of eight, nine, and eleven years.

The limit of reliable reaction cannot be stated by one investigator for another. Many side conditions of manipulation intervene. The limit is personal with the observer, and based upon observation, which, of course, must be obtained by comparison of many tests upon normal and pathogenic sera. For example, if my own blood is allowed sufficient time, it gives quite positive clump-

ing. The clumping is so satisfactory that it could easily lead to error, though I am not aware of ever having had an attack of typhoid. There is, however, in this blood no proper paralysis. This last feature is, perhaps, the chief objection to the bouillon-mass test. Jes¹² has said that many normal sera affect the typhus bacillus in bouillon after the same manner described as characteristic for typhus sera. This, I think, would appear true after any but the most careful methods of work and observation, but the facts now under record are of none the less significance. Old theories of immunity have already suffered a necessary revision, and the field of physiological chemistry is more clearly open than ever.

In regard to the use of the reaction in water-analysis, there is not much experimental basis for assertion. Stoddard definitely denies that the bulk-serum test may be considered reliable for a separation of *B. coli communis* and *B. typhi abdominalis*,¹³ asserting that *B. coli communis* is not a well-defined species, and that some of the varieties react as does the typhus bacillus. However, it appears that he is too eager to propose a new method of separation to weigh well evidence already given by others. As his new method is nothing more than almost every working bacteriologist has probably brought into use for several years, I cannot let his argument weigh even against my own limited tests, which have been positive as far as carried. It is not supposed that any bacteriologist will rely upon a single feature of diagnosis when a dozen are at hand to make belief more certain. By the reaction for the hanging-drop method I have been able to separate typhoid bacilli from an artificial mixture of typhoid and *B. coli communis* and two other microscopically similar water-forms. Also, when confused in other tests in trying to differentiate between five similar cultures from sewage-contaminated river-water, this test allowed me to select the correct culture, as attested by later inoculation and post-mortem studies upon guinea-pigs.

No good worker is sure of a diagnosis so long as there is a possibility of error. So I think one need not depend upon this test alone ; but, added to the other features open to present knowledge, I am quite certain this reaction furnishes the strongest test for microscopic methods. Consideration of all means available is necessary to good work, but to those prepared for inoculation and post-mortem examinations this reaction will be looked upon as but making the selection of the desired bacillus more certain prior to the final test of its character.

Serum for the hanging-drop method of fever-diagnosis is readily

obtained from a slight skin-blister, pin-prick, or other slight cut, but I have found trouble to even have so much given in some cases. American patients do not seem so liberal with their blood-supply as European scientists demand. It is, however, not necessary to rely upon the human supply when it is necessary to have a quantity of the test-serum for examination of many separate cultures, though one scientifically inclined patient easily furnishes enough blood from a single pin-prick to test many slides. Guinea-pigs readily become immune through artificial protective inoculation, and the serum gives equally good results. One has only to arm himself with a sufficiently virulent culture, an injecting-syringe, and a pig, and proceed by properly graded, ever-increasing injections until blood drawn from the ear of the animal gives the desired reaction. This reaction begins to show in the blood after the first heavy illness of the animal, and becomes heightened after each recurring injection, and it is soon found that the animal is practically immune.

The reaction may be obtained by the use of the serous fluids from various organs of the body, as liver, spleen, gall, lymphatics, and other glandular structures,¹⁴ but it is most intense in the blood-serum, which also furnishes the easiest source of supply.

In conclusion, I wish to express my thanks to Dr. Novy, of Ann Arbor, and Dr. Wesbrook, of Minneapolis, for cultures of *B. abdominalis* kindly furnished me by them, and, as touching further upon the specific nature of the reaction, I quote from the able investigator, Loeffler:¹⁵ "Durch die Behandlung von Hunden mit steigenden Dosen Virulenter Kulturen der Typhusbakterien bzw. Colibakterien worden in dem Blute dieser Tiere Körper erzeugt welchen eine spezifische Schutz wirkung innewohnt, nur gegenueber derjenig Bakterienarten, welcher sie ihre erstehung verdanken." This, it seems to me, is in accord with the facts.

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A REVIEW OF THE FIELD OF VETERINARY SCIENCE.¹

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It is well that we put aside our regular work from time to time and meet in this fashion, and upon such occasions it is appropriate for us to review the recent progress made by ourselves and by our profession. We can thus take our bearings and ascertain exactly where we stand in relation to the other professions, the commerce of the nations, and to our own past. There is also a temptation, particularly strong at such times, to peer into the future. So long as we confine ourselves to our regular work, to the plains and the valleys of things that are familiar to us, it is not possible to obtain this information nor to make these observations. It is only by comparing experiences, by adding the newly acquired knowledge of one member to that of another, by eradicating the ruts into which we fall so readily, and by resting our personal knowledge, thus improved and amplified, on the mountain composed of the accumulated wisdom of the ages, that we can obtain a complete view of our immediate surroundings and relations, and even an imperfect glimpse of the future.

In reviewing the field of veterinary science it is necessary to briefly consider the growth of this subject in order to fully realize our present station. The beginning of veterinary science coincides with the beginning of medicine, and is buried in the history of ancient Egypt and India. It is well known that the ancient Egyptians owned and cultivated domestic animals, especially the

¹ Presented at the Thirty-fourth Annual Convention of the United States Veterinary Medical Association, Nashville, September, 1897.

dog, ox, ass, goat, and goose. There is also evidence that the Egyptians bred antelopes in immense herds, and that this practice was given up some two thousand years before Christ, because other animals, particularly the sheep, displaced them. Although animals have been domesticated in all parts of the world, in more recent times the present list does not include more than twenty-five species, and has received no additions for several hundred years.

Animals constituted the principal wealth of the ancient roving tribes that covered Asia and gradually worked their way into Europe and Africa. It is but natural that when accident or disease overcame this valuable property that attempts should have been made to save it. Thus veterinary medicine began. As new views and theories arose in reference to the treatment of diseases of man these were applied without essential modification to the treatment of diseased animals; but the early assistance that general medicine derived from veterinary medicine is far greater than this, because custom did not permit the dissection of human bodies, and all anatomical knowledge was obtained by dissecting animals, and all knowledge of the processes of disease was derived from the same source.

As time passed more and more attention was devoted to the study of the diseases of man, and veterinary medicine was relegated to an inferior position. This tendency increased until, as a result of certain influences, domestic animals became valuable and indispensable when it became apparent that something should be done to develop means for controlling the diseases that swept them off by thousands, threatened the health and interfered with the prosperity of the people.

With the revival of learning in the sixteenth century, the study of veterinary medicine was taken up by many men of much ability and of high station, but these men were not skilled in the fundamental branches of medicine, and their labors consisted principally in rearranging and compiling the knowledge that had been acquired and recorded by their predecessors. In other words, veterinary medicine was not studied from a medical standpoint but from the standpoint of agriculture, and we find the writings on veterinary medicine included in larger works on rural affairs.

At that time there were many books on horsemanship, the breeding and general care of animals, and on animals in their relation to agriculture, but scientific treatises on veterinary medicine in any of its phases were lacking, with the single exception of the *Anatomy* of Carl Ruini. This book, issued in the year 1590, marks the

beginning of scientific veterinary literature, but, strange to say, the other branches of our science developed so slowly that it was not until two hundred years later that works on the other fundamental branches equal to the *Anatomy* of Ruini were available.

However, sufficient progress was made during this early period to indicate that the science was of value, and as changed conditions developed in the habits of the people, in agriculture, in transportation, and in warfare, the infectious diseases of animals became more widespread and caused more and more oppressive losses. The diseases that caused the greatest losses during the seventeenth and eighteenth centuries were anthrax, foot-and-mouth disease, lung-plague, rinderpest, glanders, influenza, distemper, mange, sheep-pox, and various helminthic diseases.

In the last century, while all of the communicable diseases prevailed more or less extensively, rinderpest was most prevalent and caused the greatest amount of distress and loss. It ravaged the southern provinces of Russia, Poland, many of the States of Germany, Hungary, Austria, Italy, France, and Switzerland. It was so virulent in Holland that more than 200,000 cattle were destroyed by it in 1714; in Italy 70,000 cattle died in one year. During the entire century the disease came and went in waves, certain years being marked by especially severe invasions. For a time it subsided in Holland to such an extent that the herds were re-established, but in the two years from 1744 to 1746 another serious invasion occurred, and once more 200,000 cattle were lost, thus impoverishing a large proportion of the population. A number of serious outbreaks also occurred in England. In 1747, 40,000 cattle were lost in Nottingham and Leicestershire, and 30,000 in Cheshire in six months, after which the progress of this plague was checked by the slaughter of about 80,000 animals. Foot-and-mouth disease prevailed extensively in France and other Continental countries, and anthrax rendered it impossible to rear live-stock in many localities in Europe. Glanders also prevailed very extensively in all parts of Europe.

It was about this time that the stage-coach became prominent, and vast numbers of horses were needed for this new work. There were also great numbers of large estates where many horses were bred, and the need of more knowledge and better skill in treating them became painfully apparent. The cavalry and artillery arms of the military service were also in a state of rapid development, and veterinary knowledge was in great demand in this connection. The field was ripe for the establishment of a veterinary

school, and when Bourgelat organized the first one at Lyons it was received gladly and recognized as a great advancement in all parts of Europe. The success of this institution was so great that students were sent to it by all of the principal rulers, and they in turn established veterinary schools in their own countries, all of them closely copying the French system.

While the success of these schools was very great in so far as obtaining students and government aid was concerned, the fact remains, and sad it is it must be stated, that the results of these schools for the first decades of their existence were most disappointing, and they did not succeed in drawing to them as students young men who were well trained and came from the better classes of society. While the pupils sent by foreign governments were of the better class, most of them being surgeons, skilled horsemen, and educated agriculturists, those that followed and constituted the great majority of the student body in all of the veterinary schools during the first years of their existence were from the lower classes, and it is reported that many of them were unable to read or write. The teachers in these schools during this period, which has very properly been termed the "Empirical Period" in veterinary education, were not well-trained veterinarians because there had been no opportunity for the development and acquisition of a thorough knowledge of veterinary science, and most of them were surgeons who had a certain fondness for animals, and who had amplified their knowledge of medicine by adding to it some of the empirical, unscientific, and in large measure worthless teachings of the existing literature. Of course, it could not be expected that the influence of the old empirical systems that had grown and developed for hundreds of years could be thrown off at once, and a scientific course in veterinary medicine could not be given before the science of veterinary medicine existed. It is, therefore, not surprising that the veterinary schools failed to accomplish the work that was expected of them, and succeeded only in turning out men who were not above the level of the best of the unskilled veterinarians who preceded them.

Another condition that has an important bearing upon our study of veterinary medicine was the change in the method of transportation that followed the introduction of steam locomotives. This led to a sudden and tremendous increase in domestic and foreign commerce, to greater activity in all kinds of business and the establishment of keener competition in rural affairs, and the development of new systems of husbandry. Under the old conditions, local wants were supplied entirely by local products, and what a

locality did not produce was not consumed in that district. With the improvement in methods of transportation, moreover, the wants of the people increased at least as rapidly as the means for supplying them, and changes were seen not only in methods of conducting business, but also in the social life and especially in the food of the the people.

Lydten, in a scholarly paper read before the last International Congress at Bern, called attention to the influence of this development on the diet of the people, and has shown that while meat is now at least three times as expensive as it was sixty years ago, about three times as much per capita is consumed by the inhabitants of European countries. It seems to be well established that the degree of activity of a people is indicated by the amount of flesh consumed. A more than proportionate growth has occurred in the consumption of dairy-products. It is not necessary for one to be very old to remember when milk was a rarity and butter a luxury, and to recall how these articles of diet have displaced other substances made from fruits and vegetables. The fashion in clothing has also changed to such an extent that far more wool is now required to properly clothe a person than was needed a comparatively few years ago.

All of this has led to an astonishing growth of the live-stock industry, so that the public is far more dependent upon it now than it was in the last century, when the first veterinary schools were established. The growth of veterinary science has been proportionate to the growth of the industry that is protected by it, and without such development in veterinary science the live-stock industry could not have attained its present proportions, and the progress of the whole people would have been restricted.

When it became evident in the earlier decades of veterinary education that the schools then in existence were not properly filling their functions, and after a sufficient number of well-trained veterinarians had developed, a thorough reorganization was accomplished for the purpose, as expressed in the report of the German Royal Commission: "To improve the present empirical material, and, in addition to the practical veterinarians that now exist, to educate scientific veterinarians who can be employed to direct veterinary police measures and to teach in veterinary schools." As a result of this change, which was made in all of the original schools, veterinary education became more scientific, the scope of the schools was enlarged, more and better teachers were appointed and the result has been gratifying in the highest degree. Fortunately,

these changes were made in the earlier years of the present century, and their effect has been evident for more than two generations.

Let us consider for a moment what good has been accomplished by the veterinary schools and what effect their work has had on national life and prosperity. Undoubtedly, the most effective work has been in the direction of controlling the infectious diseases of animals. Rinderpest has been exterminated from Europe, and does not prevail anywhere extensively, excepting in South Africa, where it is now numbering its victims by thousands, and is interfering most seriously with the progress of the country. If South Africa belonged to a state of Continental Europe their efficient veterinary police measures would have been introduced long ago and the disease exterminated. Unfortunately, England does not avail herself of the highest veterinary skill, and thus there is no opportunity for the amazing results that have followed its application in Continental countries.

Lung-plague, or contagious pleuro-pneumonia, has been controlled to such an extent in Europe that it does not cause serious losses at this time. Notwithstanding the fact that it once secured quite a foothold in this country, modern methods, as administered originally by Drs. Law, Thayer, and Lyman, and later by Dr. Salmon, have succeeded in entirely eradicating it. When we remember that pleuro-pneumonia was especially virulent in this country, due to the new soil that it found to operate on, to the fact that this is essentially an agricultural and cattle-breeding land, the immense scope of our territory, and the foothold that the disease had gained, we can justly consider its extermination as one of the greatest triumphs that veterinary science has achieved at any time in any country. If the disease had been dealt with as it was in England at that time, it would have spread over the entire face of the country and caused losses amounting to so many millions of dollars that it is impossible to estimate them.

Anthrax has been studied with such success that an efficient vaccine has been discovered by means of which animals can be inoculated and the development of the disease prevented. Moreover, so much light has been thrown on the life-history of the germ that we now know what measures must be taken to prevent the spread of this disease or its establishment in a certain locality after it has been introduced.

Foot-and-mouth disease, although it still occurs in most of the Continental countries, has succumbed to the veterinary police meas-

ures that are enforced to such an extent that it has not caused serious loss for a considerable number of years.

Mange of horses and scab of sheep, diseases that were formerly dreaded so acutely by horsemen and shepherds, are now comparatively rare. Distemper and glanders of horses occur from time to time, but they are kept in check so well that they no longer seriously menace the horse-breeding industry.

Texas fever, a disease which formerly destroyed thousands upon thousands of cattle every year in the United States, has been studied so thoroughly by Drs. Theobald Smith, F. L. Kilbourne, and others, under the auspices of the Bureau of Animal Industry, that preventive measures based on their discoveries are so successful that outbreaks of Texas fever are practically unknown north of the "Texas Fever Line." A few years ago outbreaks of Texas fever were very common; they occurred in the most unexpected localities and destroyed so many cattle that drovers and farmers were kept in a state of constant apprehension. Last year there was but one small outbreak in Pennsylvania, and this year not a single case has been reported in that State. This, also, is one of the greatest triumphs of veterinary medicine. But development in this direction is not complete, and the researches that are now in progress will, it is hoped, lead to some effective measures under which Northern cattle can be introduced with safety into Southern States and Southern cattle can be brought north at any season.

Hog-cholera is a disease upon which a good deal of light has been shed during the past few years, but we are still without an effective means of preventing its ravages.

Tuberculosis is an affection that is arousing much discussion at this time, is occasioning most extensive losses, and must be dealt with more seriously in the near future.

The immense field opened by the discoveries in serum-therapy is of equal interest and importance to the physician and veterinarian, and much of this recent development results from the work of distinguished members of our profession.

The international trade in live-stock has developed enormously during the past few years. It is a comparatively small matter to ship cattle three thousand, four thousand, or five thousand miles, and with modern facilities these journeys can be made in a very few days. International trade in live-stock and live-stock products, such as hides, skins, and wool, has also reached immense proportions. These also are carried quickly between points on opposite sides of the world.

It will thus be seen that without proper supervision it would not be difficult for the most dangerous diseases to be carried long distances from the most remote countries into previously uninfected territory. But every civilized country has a force of efficient veterinarians and a more or less perfect system of quarantine and control, by means of which the ravages of disease that would otherwise be conveyed by this international commerce are avoided. It is appalling to consider the effect upon the nations of the abandonment of these systems. The United States would become reinfected with lung-plague, and we would quickly import the foot-and-mouth disease, sheep-pox, swine erysipelas, dourine, and possibly rinderpest and other deadly affections. Our live-stock industry represents an investment at this time of about two billion dollars. A few of these diseases, if uncontrolled by the application of modern veterinary measures, would quickly devastate it to the amount of 25 per cent. at least. This means a loss in cash value of \$500,000,000, and there is no telling where the calamity would stop. On account of our somewhat isolated position we can protect ourselves better from the invasion of infectious diseases than the countries of Europe. There it is necessary to keep up a constant control of the most elaborate type, but it is successful in protecting the vast wealth invested in live-stock and in perpetuating the most important food-supply of the country.

The *indirect* importance to agriculture of protecting our animals is made apparent when we consider the value of their manure and attempt to imagine the appearance of our fields and farms unfed, unrenovated by this plant-food. While some districts could subsist for a time under these conditions, the vast majority of our farms would gradually lose their fertility, and become barren wastes.

In addition to the protection of the live-stock industry as a whole, which, it is evident, is essential to the continued prosperity of the country, the veterinarian finds important and remunerative occupation in the treatment of individual animals. As veterinarians become more proficient it is becoming more and more evident to the owners of live-stock that it is not profitable to allow their animals when ill or injured to languish or die or make such imperfect recoveries that a large portion of their value is destroyed, when many of these losses can be prevented by the employment of suitable veterinary skill. The veterinarian not only enables the live-stock owner to save money by preserving the life of his animal and restoring it to usefulness, but it is also economical to know that animals in certain conditions cannot recover. They can, then, upon

the advice of the veterinarian, be destroyed painlessly, and the owner avoids the purchase of special food, medicine, and appliances and many days of expensive attention.

In its relation to public health, veterinary science is constantly growing in importance. It is well known that a number of diseases to which people are liable can be conveyed by flesh and milk, and the long-continued experiences of several of the most highly civilized European countries teaches us that these important foods cannot be properly guarded and their healthfulness assured without the employment of veterinarians to examine, inspect, and advise in reference to the management of the animals that produced them, the conduct of the dairy, the character of the flesh, as determined by post-mortem examination, and the care of these delicate foods until they are consumed. In Germany nearly every city has a municipal abattoir wherein all cattle killed for local consumption must be dressed under veterinary supervision. Each abattoir is under the management of a veterinarian with the title of director, who performs all the inspections himself, or, if the business is too great for this, is assisted by as many veterinarians as may be needed. In Berlin about one hundred are engaged in this work. The assistants are not, however, continuously employed. They are in most cases local practitioners, who are engaged to devote certain hours each week to this work, and are paid in proportion to the time occupied. In this country the National Government, through the Bureau of Animal Industry, finds it necessary to employ a large number of veterinarians in work of a similar character.

The relation of the veterinarian to the improvement of live-stock, through the introduction of improved breeds and species, and improvement by care and selection is a very important one, but one that has not received sufficient attention in this country. While there is a high general adaptability to their special purposes of the various species and varieties of domestic animals that are used in the United States there is still room for great improvement, and the average individual efficiency should be increased from 25 to 50 per cent. This can only be affected by a more thorough understanding and general application of the principles of breeding, selection, and heredity; by the education of breeders to recognize and more fully appreciate the valuable points and the defects of animals kept for different purposes; by the better feeding and care of animals during the formative period, and by a closer observance of the laws of hygiene and sanitation. Much can be accomplished through agricultural fairs, and exhibitions and live-stock shows.

Every veterinarian who has visited many exhibitions can recall instances of a most dangerous and destructive character wherein animals with hereditary unsoundness and defects of conformation have been awarded premiums. It is the duty of every veterinarian to thoroughly post himself on all branches of zoötechnics, on breeding problems, and general live-stock affairs, so that he may be qualified to serve in an advisory or executive capacity at live-stock exhibitions.

In view of the past achievements of veterinary science and the local, national, and international importance of its work at this time, there can be no question as to the future of this profession. In order, however, that the highest development may be obtained it is necessary that we should grasp the full significance of our labors. The trained veterinarian is naturally the expert on all live-stock questions, and upon him devolves the responsibility for the improvement and extension of this foundation branch of commerce and national prosperity. When viewed in these enlarged relations, there is more need for veterinary knowledge now than ever before; but to satisfactorily fulfil all of these modern requirements it is necessary that the veterinary students should receive more special training in some subjects that are now looked upon as minor branches by most of the veterinary schools.

When the veterinarian is the generally acknowledged expert on all questions of animal husbandry, and is freely consulted in matters of hygiene, breeding, selection, and feeding, the construction of stables and related matters, as well as on pathological questions, his field of usefulness and occupation will have become so broad that there will be a far greater demand for his services in every breeding and farming district, and this will continue to grow as the direct advantages afforded by such consultations become evident.

THE SIGNIFICANCE OF THE CAPTION OF A PAPER OR AN ADDRESS.

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A CONSIDERABLE degree of importance should be attached to the selection of a proper title of a paper or the subject of an address. Veterinary literature is being searched daily by those conducting investigations along certain lines, and it is necessary for the investigator to know the complete history of the work that has

preceded him. He naturally consults those works having titles pertaining to the special subject he has under consideration. Many valuable papers are passed because the title does not indicate their character, unless, perchance, he should read them or his attention be called to them by some one.

Such captions as "An Interesting Case," "An Interesting Observation," "An Experiment," "Cases from My Note-book," etc., are of frequent occurrence in our literature. There is nothing about such titles to indicate the character by which they may be classified. A perusal of the articles usually shows that a much more appropriate caption might have been selected.

Two captions by which many carefully prepared pieces of work have been buried are "A Paper," or "An Address," by Dr. ——. Not all papers or addresses are prepared upon a single topic, but the majority are, and to have them appear without an appropriate subject is to limit their usefulness to those who may read them when they are published. They do not appeal to the busy student in succeeding years. Many of the most valuable papers published in the earlier volumes of the *Veterinarian* are thus buried. The same is true, however, to a greater or less extent of all our journals, even to the present time.

Recently the writer has been preparing a card-index of the veterinary literature in his private library, and has a total of over forty thousand reference-cards. Of this number more than three thousand are useless, because of improperly selected titles. This is unfortunate, but indicates the greater care that should be exercised in the future.

Second only to a proper selection of a title is the desirability of having the full name. It is an honor to be distinguished as principal, professor, or doctor ——, and be known to the entire profession. But time passes rapidly, new members are added to the profession, and men of the same name, occupying the same or like positions become contributors to the journals, and confusion arises in ascribing some of the work to the proper author. It has already become a difficult task to prepare a bibliography of some of our well-known writers, because of using the title of his position to distinguish him, instead of his full name.

Iowa is said to have suffered a loss of \$15,000,000 from hog-cholera alone in 1896. Surely too great a burden for any one Commonwealth to have borne in these times.

SOME SALIENT POINTS IN CANINE PRACTICE.¹

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WITH none of our friends and helpers among the lower animals would we part so reluctantly as with the dog. No speechless associate of man has ever so entwined itself around the very roots of our domestic life as the dog; none has won so much admiration, confidence, and affection; none has appealed to so large a number of mankind of every condition, age, and sex. It will, therefore, be conceded that so noble, so intelligent, and so faithful an animal as the dog is entitled to the most complete understanding and the best usage of which we are capable.

The professional treatment of the dog in disease naturally falls to the veterinarian; but, inasmuch as the dog is very different in his nature from the horse and other herbivora which engage the chief attention of the veterinary profession, it follows that if the dog is to be treated on a rational basis, he must be made the subject of special study by the veterinarian.

A knowledge of equine medicine goes but a little way to qualify a man to treat the dog successfully, and the sooner this is recognized by the profession of comparative medicine, the better it will be for both the profession and our canine friends. If the veterinarian hopes largely to acquire the confidence of the public as regards dogs, he must show not only that he has a grasp of medicine as medicine, but a special knowledge of the nature, varieties, and peculiarities of dogs. The dog must be understood in health, before his ailments can be appreciated and treated, and the more intelligent body of breeders and owners of dogs thoroughly recognize this. To successfully treat a dog in sickness, and for the veterinarian to be proficient, he must study the dog in health. By this course the individual under treatment is known, and thus acts as a mariner's compass as to the diagnosing of the disease. The principle will bear repeating: Try, as much as possible, to become conversant with the habits and actions of the dog in health, and the diagnosis of disease will be greatly simplified.

We have now to consider those deviations from the normal which constitute what is termed "disease."

Disease is nothing more than an altered function, a more or less

¹ Presented for consideration at the meeting of the Minnesota State Veterinary Medical Association, Owatonna, July 14, 1897,

departure from the natural condition ; hence to know what is the natural condition of an animal is the first requisite for the understanding of disease. We must always have a standard of comparison. Scientific medicine is impossible without scientific pathology, or knowledge of altered function, and this, again, is dependent on a sound physiology or knowledge of the normal behavior of the body. Treatment is based on both as well as a knowledge of causation.

The most useful instrument in diagnosing disease in a dog is the thermometer, and here is where the value of being thoroughly acquainted with dogs and their temperament takes place, or becomes valuable, for we must recognize differences not only for breed, age, sex, etc., but also for each individual. From personal observation and experiments made in taking the temperature of dogs of all kinds, from the great Dane and mastiff to the rat-terrier and lap-dog, as well as from information obtained from reliable authors and other sources, we find that the temperature of the dog very rarely falls below 100° , and it is also important to note that it may rise to 102° or even 102.5° , so that a conclusion that fever exists cannot be made on a reading of 102.5° , especially in a puppy, in which the temperature may naturally be higher than in an adult dog, and is liable to oscillate, as in human infants, very rapidly. But temperature under 99° or over 103° should arouse suspicion of disease, and even a temperature of 102.6° , if constant, cannot be normal.

The pulse, as indicating the rapidity and character of the heart-beats and the condition of the arteries, conveys to the experienced a world of information. It may be conveniently taken in the groin of the dog, but often it will be necessary, especially in the case of small dogs, to attempt to get at the state of the heart directly, which can readily be done in the dog by feeling the organ through the chest-wall. As the dog is a very excitable animal, he must be quieted and soothed as much as possible when the pulse is being taken, or the heart examined, especially by a stranger. In all cases it must be ascertained that the pulse is not merely transiently affected as the result of temporary excitement from the very process of examination or otherwise. Also the variations natural to the different position of the body are not to be forgotten.

The pulse at birth is very rapid—130 to 160; for the first three months, 120 to 140; at from the sixth to the ninth month, 90 to 110; after one year, 70 to 90. It must be understood that these are only rough estimates, so wide are the variations with age, sex, breed, position, temperament, etc. A merely rapid pulse, with no

elevation of temperature or other unfavorable symptoms, is not of great significance usually. It is to be borne in mind, too, that when an adult dog is quietly sleeping the pulse may be very slow, even to 40 beats. I also wish to draw special attention to a feature of the pulse of the dog to which reference is seldom made—that is, with each expiration the pulse is slower and stronger and beats uneven—a condition of things which, if in man or any other animal, would be certain signs of disease in a large proportion of cases, and a dog that shows the phenomena in question decidedly is never a puppy, and they are never absent in a mature dog, so that these constitute in some measure an indication of age. By the inexperienced these peculiarities might readily be mistaken for abnormalities of the heart. The ratio of the respiration and pulse in the dog is about the same as in man—that is, about one to four when the dog is not heated or excited by overexertion.

It can readily be seen from the foregoing that the student of canine medicine should associate as much as possible with the dog to acquire the desired familiarity. The idea that a student of medicine can get all the knowledge of the dog that is required from seeing sick animals as they may be brought to an infirmary, though widespread, has not proved correct; and perhaps explains in no small degree that lack of confidence in veterinary surgeons as regards the dog, which is certainly prevalent, if not well founded. Departure from the normal can only be adequately appreciated by him who knows the normal (healthy) dog.

The physical examination of the dog is easy in itself, but may be troublesome if the animal is restive or fractious. I have heard even veterinary surgeons say that the dog should be taken out of sight of its master, quickly thrown down and so handled that he will be taken by surprise and offer no resistance. Remember a dog is a being of great sensitiveness, of strong likes and dislikes, and has a remarkable instinct and memory. A dog may be so treated that it will be almost impossible for the same person ever to succeed a second time in examining him or giving medicine. Moreover, if a dog resists it is impossible to form a correct judgment, as his functions are disturbed by that resistance. If a dog is treated so that he shall see that no harm is meant him, he will usually quietly submit according to his natural amiability, a little rubbing of the head, a few soothing words, a gradual approach toward the real object may occupy a few minutes at first, but save indefinitely in the end. Now and then there are exceptions; but in my own experience they are very rare. Therefore, in making an

examination of the dog it is most important to do it in such a way as will render it easy of accomplishment on the next occasion; unless this be carried out so that it is at least not disagreeable to the animal, or as little so as possible, the trouble will increase on each repetition.

The closer observation and investigation we make the more we are led to see the similarity between the physical constitution of the canine race and that of man, also the similarity in the character of his diseases and the way in which medicines and other remedies react on him. It is quite impossible to treat the dog successfully on the same principles as the horse, ox, etc., while with comparatively few exceptions human medicine is directly applicable to the dog. As the treatment of the dog falls to the veterinarian and not to the human physician, it is all the more necessary that a special study should be made of the dog, taking human, rather than equine medicine and doses, as the standard of comparison; hence in treating the dog we have to use the same or similar food-stuffs, similar medicines, in similar doses, and the same external and internal treatment generally with man.

A very few drugs are known to be required in larger doses for the dog than for man—aloes; but this medicine alone is not a good remedy for either dog or man. Dogs are peculiarly liable to be salivated and even poisoned by the use of calomel, or mercury, in any form, so that great care must be taken to see that it is administered in very small doses ($\frac{1}{4}$ to 3 grains), and speedily removed from the system by a saline or other aperient. Turpentine is another drug dangerous to the dog, but the same applies to man. It is also important to note that opium or morphine can be tolerated to an almost unlimited extent. A large dose of opium nauseates a dog profoundly, but is not at all likely to poison him.

A rule for the dose of any medicine given to the dog, based on that given to the horse or any other animal, is extremely difficult to lay down. In general it may be said that for the largest dog (St. Bernard or mastiff) the dose is the same exactly as for a full-grown man. For a dog of, say, forty pounds, a dose about the same as for a fourteen-year-old boy, or two-thirds that of a man. In the case of small matured dogs, such as terriers, spaniels, pugs, etc., one-third to one-half the latter dose will be near the mark. In the case of puppies two months old or under, the less medicine given the better; very few and small doses. For constipation in suckling puppies treat through the mother.

Methods of administering medicine are of similar importance to

the method of examination, before given in this paper, because of the difficulties that arise if the animal becomes unmanageable or objects seriously to the treatment. Harshness with dogs is so radically opposed to their nature that it in every way defeats the end in view.

Each practitioner has his own methods of giving medicine. I will here give a few methods:

1. Get the dog backed into a corner; press the lips against the teeth; when the mouth is open, pass the medicine far back, rapidly close the mouth, and wait for the dog to swallow, covering the nostrils, if necessary, to compel him to do so.

2. Insert the mouth of a small-necked bottle containing the medicine in the pouch between the angle of the lips, pouring the liquid back.

3. Pouring medicine down, if liquid, from a spoon.

4. Giving pills in meat.

5. Attaching a cloth to the upper and lower jaw to hold them open in the case of dogs large and hard to manage.

6. Keep the head up after administering, to prevent vomiting.

While the above methods may be useful as guides, and successful or necessary in some cases, the nature of the dog and the amount of experience one has must greatly determine the method. If possible, it is well that a dog should not know that he is getting medicine at all, so that if the latter can be given in small pieces of meat it is most desirable. Modern pharmacy has greatly aided the canine practitioner in the manufacture of pills and tablets and capsules, thus making medicine easy of administration, as a dog's stomach will not tolerate nauseous draughts. So many drugs are now put up in useful combinations for man's use that we can avail ourselves of a large field for selection. Gelatin capsules No. 0, No. 00 serve every purpose for dogs. It is often necessary to give castor-oil to dogs. This is done with greater ease if the spoon and oil are both heated, when it will run off the spoon and down the dog's throat easier. Quickness in the administration of medicines is of great importance.

My own way of giving medicine to a dog is: Never use fluids that must be poured down if possible to avoid it. Get the dog against a wall, a corner preferred, between the knees, press on the lips just enough to cause the mouth to open, then insert the gelatin capsule, moistened with saliva, far back on the tongue, and giving it a gentle push with the fingers, suddenly close the dog's mouth, when he usually swallows, unaware almost of what has happened.

Then pat him on the head, say an encouraging word, and he has no worse opinion of his physician than before.

Hypodermics are usually not advisable in the treatment of the dog, only when the stomach will not tolerate medicine.

In all dealings with dogs the motto should be: Decision, rapid action, and gentleness.

PATHOLOGICAL SHOEING.¹

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THE subject of my paper, "Pathological Shoeing," is one that has attracted a great deal of attention, especially of late years, and the discussion has brought out a great variety of opinions. It is a subject of such a nature that, if one is interested, he will find that each day adds to his knowledge, and there is no saying how long a man may study and practice before becoming expert enough, by looking at a horse's foot, immediately to know the kind of shoe to apply to correct a certain fault. But I believe that by study and observation a man can acquire this faculty, and will recognize that the same faults in different horses cannot all be corrected by any one method.

The horny box contains the lower portion of the second and third phalanges, the navicular bones, and lateral elastic fibro-cartilages, covered by a vascular network allowing of but moderate movement, and synovials of the flexor-tendons, resting on an elastic cushion, all enveloped in a dense keratogenous box—wall, sole, and frog.

In the horny box, in front, besides the bones, are observed the anterior extensors of the phalanges; on the sides, the anterior and posterior lateral ligaments. The lateral cartilages occupy the space between the posterior border of the anterior lateral ligaments and the anterior borders of the posterior lateral ligaments. The perforans tendon, behind, reaches the navicular bone and spreads into a wide, keratogenous or horn-growing membrane. The plantar cushion is a fibro-fatty mass, in shape like a frog, and lies against the posterior portion of the phalanx, and corresponds to the faces of the lateral cartilages, and is continuous with their fibrous capsule; the inferior surface rests on the superior face of the frog; it is dense and elastic.

¹ Read at the June meeting of the Schuylkill Valley Veterinary Medical Association.

The horny box comprises the wall and sole. The wall, if spread out, would be a perfect crescent; the ends of the crescent turn in at an acute angle behind, being the heels, and extending obliquely forward and converging toward each other, comprise the bars; immediately above the heels can be observed the glomes. The outer wall is usually the thickest. At the upper extremity of the wall is a concave bevel (cutidural cavity), in front the periople or coronary band. In very young animals this band extends down the wall, but in the rasped hoof it has disappeared, except at the top of the wall, where it is thick and adherent.

Structure of horny box: On the inner side a series of laminæ, five to eight hundred in all (if spread out on a flat surface would probably cover a space of twelve square feet); the longest, corresponding to the length of the wall and one thirty-second to one-eighth inch in width. Next to the laminæ a layer of white cement, next a layer of dense fibrous tissue, then two more layers of fibres, increasing in density from within to without. Where the sole joins the wall the laminæ disappear, thus bringing the sole in direct apposition with the cement layer, which is always in excess where the sole joins the wall. The frog—a homogeneous, wedge-shaped structure—is continuous with the coronary band. In alluding to the white line I mean the cement layer, the bony column from the metatarsus or metacarpus to the third phalanx included.

To come at once to the subject of this paper, we will first consider a perfect foot and hoof—one upon which a horse travels perfectly sound. The bones are and must be in perfect apposition, and are a column. The front limbs are vertical with a line drawn from the point of the shoulder down. The os pedis is level and on the same horizontal plane with the sole, which itself is level. Quite a number of horses are brought for treatment that would travel square and sound if the hoof was level, which is essential, though most farriers seem to attach little importance to it, viz., if too much wall to the outside, the horse would stand wide, the os pedis would not be on the same horizontal plane as the ground, but the bones would represent a straight column, though they would be in an oblique direction from the body. In this case by simply making the foot level the animal would stand in a correct position and be made to travel square. The horse will always travel or stand in a position that will cause the bones to be a perfect column; thus he points, invariably, to the highest part.

The trouble with many farriers is that they do not understand the art of levelling and balancing, which is the first and most

important knowledge. If the wall be pared, cut, or rasped to a level with the sole, the white line is plainly and evenly seen, and a level bearing is assured from the ground up—that is, of course, providing the structures in the hoof are normal. If the heels of the front hoof are too high, the horse will point back under himself. The hind feet may be perfect, but they are necessarily carried forward under the body to assist the balance. In this way the structure of the hind feet will become overtaxed, the horse lame in all four feet (an example where the good suffers with the bad).

In a case of sore-tendons all that may be required is to level the hoof. A centre-bearing shoe corrects nearly all faults, because, with such a shoe, the horse is allowed to rock and to seek the position most comfortable; he almost immediately ceases to point, and, though painfully lame before applying the centre-bearing shoe, an improvement will at once be noticed.

In a case where the hoof is found to be level and the horse points, one would at once know that the bottom of the hoof and the end of the column of bones are not on the same horizontal plane. Take, for example, a horse standing with the front feet ten inches or more apart, you would know at once that there is a greater space between the os pedis and sole to the outside than to the inside, and at the same time the bottom of the hoof is perfectly level. You will understand at once why the animal stands and travels so wide, viz., to cause the bones to stand as a straight column, though it is an oblique column. A horse travelling wide from the above cause usually interferes, striking the inside of the opposite leg a little above the fetlock-joint at each step. The farrier might wonder how a horse travelling so wide could interfere, but any intelligent veterinarian can readily comprehend: as the foot is lifted from the ground and the leg advanced the adductor muscles carry the foot in, giving it a semicircular movement, while at the same time the hoof rotates in and strikes the opposite foot, usually above the fetlock-joint. If this fault is due to an uneven hoof, levelling is all that will be required; but due to pathological changes as above described, or as often observed in the so-called awkward colt, caused by an unbalanced third phalanx, it is usually inherited. In such a case pare and rasp the hoof level, then apply a shoe elevated to the inside by means of two calks, placing one back of the inside toe and the other crossing midway the line of the inside. The horse will almost at once bring the limbs into a vertical position—*i. e.*, vertical at a line drawn from the point of the shoulder down—and the bones will be a perfect column. The horse will

travel square, semicircular movement of the leg and foot and rotation of the hoof will cease, and, in consequence, will not strike.

It is common in some localities to see awkward colts—*i. e.*, cow-hocked—toes turned out of both front and hind limbs. The owner usually finds it necessary to use boots on his horse. In a case of this kind, where the animal straddles widely, the toes turned decidedly out, a modification of the above shoe will cause the animal to go square almost at once. It consists in, first, making the foot perfectly level, then applying a shoe provided with a calk to its inside, the calk to be two inches long. Instead of allowing the calk to be of a uniform thickness it is made an inclined plane, starting square and fully a half-inch thick in front, and gradually decreasing from before to behind, where it ends level with the shoe.

A horse perfectly balanced to-day may lose that nicety of equilibrium to-morrow, if, being reshod, a perfectly level bearing is not obtained. An enormous growth at the inside or outside, or at the toe or heel, will cause the horse to point, and always to the most elevated place—as he will also point toward the highest part of an uneven shoe, though the hoof be level. A perfectly sound horse can be made to stand in a number of strange positions at the will of the man who does the shoeing. By putting on a shoe elevated at the inside, if the calk is high enough, the animal will be made to cross his leg, which proves how easily a horse's balance can be affected. The various directions a horse will point, being too high at parts, are too numerous to mention. When a horse points it is to get relief for an unbalanced, tired phalanx, which would naturally cause pain if the horse would stand to the vertical line. Thus the trouble continues, the horse not always being able to take care of the structure of his foot, and, especially when travelling, becomes painfully lame, and goes from bad to worse—the much-reiterated “no foot, no horse,” becomes a fact with most owners of such unfortunate animals. Why? Because the owner, after spending considerable money for shoeing, and as much more for medical treatment, is so disgusted that the horse is sold for a mere song to a carter. A good horse is thus sold and isolated from his proper sphere for the want of proper treatment.

To recognize an unbalanced third phalanx, and to be able to know the position of that bone in the horny box from the way the horse stands, is the problem to comprehend to be able to correct all faults, and in correcting any trouble a perfectly level hoof is essential; but if the third phalanx is unbalanced in a level hoof,

you have an abnormality to deal with—one that has undergone pathological changes as above described. In such cases an instance of treatment has been mentioned.

An interesting way to make oneself understand the causes of different lamenesses and pointing from an unbalanced third phalanx, is to procure the third phalanx, have a stick eighteen inches long fastened to its pyramidal eminence, attach a string at the upper end of the stick, and put a weight on the lower end of the string. Place the third phalanx on a level and the stick will stand vertical ; then by raising the third phalanx at given points, singly, by means of a ruler, one can readily perceive the different troubles that such a condition would cause in the living horse, and why the animal would point.

A thorough practical knowledge of the theory laid down in this paper will make a man so competent that he will not get a case of interfering which he cannot correct, and that, too, at the first dictation at shoeing.

Various kinds of shoes are used. The “ball-bearing” is an iron plate, the lower portion convex, representing part of a sphere. If this shoe is used on a horse painfully lame, from an unbalanced foot, a remarkable improvement will be noticed when the horse is led away from the shop.

Another shoe which allows the horse to seek the most comfortable position, whether standing or travelling, is the centre-bar shoe, made by having the bar run from the toe and resting behind on a bar crossing at the heels. The centre-bar is to be a decided rocker from before to behind. A centre-bearing shoe acts exactly like the ball-bearing. It is a cross at the centre of the shoe, and a calk placed exactly in the centre of the bar acts as a pivot.

To prevent a horse from forging, allow a long toe to the hind hoof, and there is an advantage in allowing the toe of the shoe to extend half an inch beyond the toe of the hoof. The front hoof should be perfectly level and as short at the toe as allowable. The shoe should have a decided roll from two inches back of the toe to the toe. I have frequently observed farriers, when treating forging, allow the wall of the hind hoof to extend beyond the toe of the shoe, giving as an excuse that if the horse would strike he would hit with the toe of the hoof and not with the shoe, and thus do less damage ; but, of course, the latter method would not by any means remove the cause.

In contracted heels the hoof gets smaller, the frog becomes atrophied, there is an increased concavity of the sole, and the walls at

the quarters and heels approach, and may become almost vertical. The outer surface of the wall is usually dry, and the hoof is predisposed to crack. A shoe fitting too tightly at the heel, and nails driven too far back, preventing the hoof from expanding normally when the weight of the body is placed upon it; allowing the shoe to remain on too long, the hoof getting an abnormal length and growing away from its vascular supply, causing it to dry out; rasping the walls, as practised by farriers, allowing of evaporation and diminishing elasticity; cutting the bars or opening the heels, as it is termed, are some of the easily recognized causes of contraction. Pare and rasp the hoof until the white line is plainly and evenly seen, and then the hoof will be at a proper length; turning the horse in the field, or wearing tips, if kept at work, are two remedies, but not always satisfactory to owners. The heels can be spread beautifully in four or five weeks, while the animal is at work, by means of the hoof-expander, the patent of the late Prof. David Roberge, of New York city. If the heels are to be spread by means of a bar-shoe, the bar should be the shape of a V, the point of the V resting well toward the centre of the frog.

For corns a shoe must be so constructed as to avoid the corn altogether, as toe- and quarter-cracks, when they occur, are usually a sequel to one of the above. I will not speak of a certain shoe to correct this trouble; predisposing causes must be dealt with, the hoof can be softened with oil, and then the crack completely cut out in the shape of a V; then if the hoof is kept soft, and its other troubles looked to, a sound hoof is assured.

Horses having heels that grow down vertically should receive special attention in keeping the heels at proper length, lest the horse becomes worthless. Such animals should be provided with a shoe that rocks backward. It is a cure as well as preventive.

Knee-sprung can result from various troubles, but is usually caused by the hoof being too high to the inside, in which case the knees are noticed to be out as well as sprung forward; whereas, if caused by being too high at the heels or toes, the knees are noticed to be sprung straight forward. A horse becoming knee-sprung from an overgrowth at the inside of the hoof is subject to other troubles, such as bursa enlargements, spavin, and ring-bone, the too great height at the inside causing an excess of pressure upon the bones at the joints, producing inflammation and bony deposits. Nine horses out of ten suffering from inside spavin are too high at the inside, and usually toward the toe; therefore, by paring the hoof level and applying a shoe that has its

inside toe cut down to a decided bevel-roll, the horse will frequently be made to go sound. The outside spavin, or any exostosis at the joints at the outside of the limb, is caused by the outside toe being too high, and naturally the treatment is the reverse of that for inside exostosis.

Knuckling of the hind feet is caused and cured in the same manner as knee-spring and bony deposits.

If a colt is watched and cared for, or I might say if all colts were looked to, in regard to keeping the hoofs pared to the proper length, all the troubles resulting from an unbalanced third phalanx would be avoided. This assertion can be verified by calling your attention to the colts and horses on Mr. Robert Bonner's farm. He always has a hundred or more, and takes particular care in keeping their hoofs at a proper length by paring and levelling whenever necessary. In consequence, he raises colts to horsehood, and not a faulty animal is found on his farm.

I might continue this paper to twice its length by dwelling on other lamenesses and methods of correcting the same; but I am fearful that I already have taken up too much time by explaining things that would be readily understood by the profession. I will reiterate that an unbalanced third phalanx is the cause of all trouble, and that knowing how to level a horse's hoof and to bring the phalanges into perfect apposition is the key to the only true method of pathological shoeing.

SELECTIONS.

REFERRING to poisoning by larkspur or monkshood, Veterinarian Knowles, of Montana, issues the following pertinent suggestions: The most widely distributed species grows in almost every part of the State. This species is without hairs at the base, but with spreading hairs above. The leaves are five-parted, with divisions two or three cleft. The flowers are large, deep blue; the upper petals veined with purple, the spur long and slender. From the observation of several cases of larkspur-poisoning, which happened in Montana early in the spring, at a time when the blossoms and seeds had not yet been produced by the plants, without any doubt the poisonous principle in larkspur is distributed throughout the whole plant (root, leaves, flowers, and seeds), and, therefore, poisoning may occur at almost any time during the life-period of the

plant. I ascertained upon close investigation that cattle and sheep are most likely to eat the plant and become poisoned when they are on a range short of grass or when turned immediately into a locality while hungry and in a condition to eat any plant-life in sight.

The common symptoms of poisoning in sheep and cattle are manifested first by the animal straying behind the herd, appearing dull and indifferent to its surroundings, but if suddenly startled will walk in a directly straight line until meeting some obstruction, when it probably falls, makes but a few struggles, lying remarkably quiet under the influence of the poison. There is rarely any bloating or hoven, but in nearly all cases a dribbling of saliva from the mouth, champing of the jaws, and frequent attempts at swallowing.

The treatment most successfully applied has been pouring water of ammonia onto a rag or sponge and holding the same to the animal's nose until it fully inhales the fumes of the ammonia; it sometimes is necessary to pour five or six drops of ammonia into the nostrils. The administration every ten or fifteen minutes to sheep of a teaspoonful of ammonia-water, and the administration of alcohol (in tablespoonful-doses) diluted with three times this quantity of water every fifteen or twenty minutes, will be found beneficial when ammonia does not promptly relieve the animal. Where it is possible, and the drug is accessible, a hypodermic injection of the sixtieth of a grain of atropia sulphate to sheep and one grain to cattle will bring about a cure or relieve the poisoning rapidly, often reviving them when they are apparently beyond help. Digitalis and nux vomica in small doses are also useful, and frequently bring about a cure very promptly.

The *New England Farmer* very effectively answers a correspondent who says "where the eye fails to detect tuberculosis the disease is so infinitesimal as to preclude its danger to consumers of meat and milk."

The disease may advance considerably, even so much as to make it possible that the milk and meat may be diseased before the eye can detect any trouble. Still we admit that tuberculin will also detect the disease in such early stages that the milk and meat at the time of detection are perfectly wholesome; but we must remember that while the animal might grow no worse and might even recover, the chances are that in the majority of cases the disease would increase until both milk and meat might be dangerous, and the animal a loss to its owner. When the danger-point comes and is passed no one can tell.

We do not see how anyone can dispute these fundamental facts. The best method of procedure to be adopted, based upon these facts, is, as the *New England Farmer* has stated many times, a matter of doubt; and unquestionably slightly diseased animals can be isolated and cared for so that they will not contaminate others, and so that they may have many years of safe usefulness; but how much will the average farmer save by going to the expense of isolating such animals and caring for them as would be necessary under the circumstances? Would not the average farmer be about as well off to kill such animals at once, especially if the State will pay part of the expense, as he would be to attempt a course of isolation and doctoring? It is not economy to pay two dollars for the purpose of saving one.

While it may be that the communication of consumption to the human family through the bovine is "extremely improbable," it is a fact that the preponderance of medical sentiment regards the communication as possible to such an extent as to urge many precautions which were not regarded necessary a few years ago.

VACCINATION OF TUBERCULOSIS.—Richet vaccinated a dog with tuberculous poison which had been taken from a fowl. Some months later he vaccinated this same dog as well as five others with human tuberculous poison. All five latter dogs died of tuberculosis within four months, while the first dog remained continually healthy. A second dog was now handled exactly as the first dog. He, together with five others, was sometime later infected with human tuberculous poison. Again, the five dogs died of tuberculosis in a longer or shorter time, while the first one remained sound. A third time Richet vaccinated another dog, not with fowl-tuberculosis, but with a weak dose of human tuberculous poison. Later this dog, together with another, was infected with large doses of human tuberculous poison. The former remained healthy; the latter died of tuberculosis. That it is not a question here of accidental immunity is proved by the death of the five dogs in the first two experiments. It can only be assumed that immunity is brought about by the weak tuberculous substance. However, this is, alas! not free from dangers; although it is undoubtedly effective, it kills about 50 to 75 per cent. of the animals experimented upon. For the present it cannot, therefore, be utilized in therapeutics.—*Berl. th. Woch.* in *Thierarzt. Centralblatt*, November 1, 1896.

EDITORIAL.

THE VETERINARY PROFESSION: ITS RELATION TO THE
HEALTH AND WEALTH OF THE NATION.

THE above is the comprehensive title of a pamphlet that has just been issued by the Veterinary Department of the University of Pennsylvania. This publication contains about twenty articles by distinguished alumni of the University of Pennsylvania, in which the various phases of veterinary work are discussed in all their bearings. It is illustrated by sixteen full-page, half-tone plates of scenes about the Veterinary Department and University.

The introductory article on "Veterinary Medicine" is by Dr. William Pepper, Professor of the Theory and Practice of Medicine and of Clinical Medicine. Dr. Pepper calls attention to the dignity and importance of veterinary work, its probable future, and the rewards that it offers for thorough students at the present time.

This pamphlet serves to show the great scope and value of veterinary science, and treats of a number of most important subjects that are too frequently lost sight of. The matters of diseases of animals transmissible to man, and meat-, milk-, and dairy-inspection as practised under national, State, and municipal direction are discussed in detail. The advantages of a veterinary training to the breeder and the physician are the subjects of two of the most interesting papers in the book. The development that may be expected in the science of horseshoeing, it is shown, must come from the veterinarian, and the advantages of such development are made manifest. The pleasures, trials, and rewards that fall to the lot of veterinarians practising in the East, South, and West, in city and country, are dwelt upon separately in articles that cannot fail to yield encouragement to the bulk of the profession, but to which no exception can possibly be taken because they are written by men who know whereof they speak; they are judicious and instructive. Veterinary science as it is taught in agricultural colleges, canine practice, a course in veterinary medicine preliminary to advanced work in medicine, the veterinary service in the United States Army, are subjects of short articles that are full of information and sound reasoning.

The entire book comprises eighty-eight pages. It is gotten up in the highest style of the printer's art—it is really a typograph-

ical gem—printed on the best of paper, the cover illuminated in the University colors—red and blue. The entire work cannot fail to make an excellent impression on everyone into whose hands it may come. It is safe to say that this is the most comprehensive, most reliable, and best publication on the subject so cleverly expressed by the title that has ever appeared in America. While it is issued by a veterinary school, it is in no sense a catalogue or prospectus, but a fund of information dealing with the veterinary profession in a new and original way and on a high plane.

This publication will do much to educate the public to a more complete recognition of the value of veterinary work, its general scope, usefulness, and possibilities, "its relation to the health and wealth of the nation."

ALASKA—KLONDIKE.

THE suggestion made by one of the resident missionaries of Alaska that our government would do well to stock that country with reindeer should not go unheeded. Perhaps our Bureau of Animal Industry would find this another avenue of great usefulness to our people. The animals would live, and, under proper care and direction, do well, and be a source of supply of milk, meat, and clothing, tending largely to mitigate the hardships of that country. There is sufficient for them to feed upon, and their disposition to forage under the snow fits them peculiarly for that region and its people.

We are not aware of any special information as to the susceptibility of these animals to tuberculosis, but no doubt if affected they would respond to the tuberculin-test, and the country could be stocked with animals free from this disease, and occasional examinations would keep them practically exempt. The climate of Alaska is not favorable to the multiplication of the tubercle bacilli, which adds to the worth of the suggested plan. We should not forget the parental duty of our government in conserving the best interests and welfare of the whole people, and we especially commend this suggested aid to the consideration of Secretary Wilson and Chief Salmon.

THE FUTURE OF SERUM-THERAPY.

THE serum-treatment of diphtheria in Berlin is said to have brought the average mortality down to 12.3 per cent. in a total of 5794 cases. Its application to tuberculosis goes on, and gratifying

results are being reported. Dr. Paul Paquin reports some 226 cases treated with antitubercle-serum, with forty recoveries and a large number of improvements. Leprosy, cancer, Asiatic cholera, swine-plague, and snake-bite are all new fields for the employment of the serum-treatment, and the future is full of promise in these disastrous and painful afflictions. In comparative medical science we have many promising fields for the employment of treatment along these lines, and with many new workers in the field we are sure that much will come from their labors. The losses of a monetary character in the live-stock industry are such as to demand more efficient measures and to warrant the most extended investigations, with the hope that the losses may be in a great measure controlled. We are glad to note that the General Government, and several of our State governments, notably Nebraska, Pennsylvania, Minnesota, Wisconsin, and Texas are making appropriations of money, and are securing the best talent to work out these perplexing problems.

WHERE NEXT?

THE thirty-fourth annual meeting of the United States Veterinary Medical Association will largely influence the place of meeting for 1898. The Executive Committee will have to decide whether Nashville can be considered an Eastern, Western, Central, or distinctly a Southern meeting. We had supposed that as it was so far removed from what was for so many years its chief Eastern centre that it would naturally fall to the East in 1898. We had learned of Boston being in the field for next year's meeting, but she will first have to win a decision that Nashville is a Western meeting. Nashville presents a new phase in Association affairs, and as it is distinctly a Southern meeting there must necessarily be a Northern section of our land yet untouched, and we are glad to note a new face in the field, no less a worker and hustler than our esteemed colleague, Dr. M. E. Knowles, of Montana; and he means to have heard at Nashville the claims of this wonderfully beautiful and important section of our country. Not to be lagging in the race, Colorado and Indiana are joining hands to take the meeting West next year. Surely no better signs of a healthy, progressive growth of our Association need be presented than this, and the friendly competition for place is a happy sign of the times. *There is room for all newcomers in the field.*

A WELL-MERITED APPOINTMENT.

READERS of the JOURNAL will be pleased to learn that Dr. S. D. Brimhall, a graduate of the University of Pennsylvania, has recently been selected for field veterinarian by the Minnesota State Board of Health to assist Dr. Reynolds, and is already doing most excellent work for that State. Salary, \$1800. The doctor is very kindly remembered in Philadelphia by the veterinarians who were in college with him, and by the veterinary faculty of the University as a conscientious student and a thorough gentleman.

The Minnesota State Board of Health and the State Experiment Station are now co-operating in field experiments with hog-cholera-serum. Dr. Peters is doing the laboratory work and Dr. Reynolds is planning and managing the field-work. Dr. Brimhall is now in the southern part of the State engaged in this work.

THE WAY OF THE TRANSGRESSOR IS HARD.

DR. H. E. WAND, formerly of Philadelphia, recently of Newtown, Pa., must surely have realized ere this "that the way of the transgressor is hard." His recent incarceration in the jail of Chester County, for the forging and raising of checks, the imposition of his worthless checks on his colleagues, and the securing of loans of instruments and not returning them, and many other misdeeds wholly unprofessional, have brought to him, and are sure to bring suffering to those who are so forgetful of self-respect and duty to their colleagues, and it should be a lesson to those who, unmindful at times of the danger, find themselves in perilous positions following a digression from the pathway of professional duty and ethics.

BETTER SAFEGUARDS NEEDED.

THE localized outbreak of anthrax at Dubois, Pa., in August, which received considerable attention at the hands of the public press throughout the country, has been investigated and placed under control through the efforts of the Pennsylvania State Veterinary Sanitary Board. This investigation revealed the facts that this outbreak was from an importation of goatskins from China, and that there exist no barriers whatever to prevent these localized outbreaks at any time, inasmuch as no precautionary measures are taken to sterilize these hides or hair (used by plasterers) or any

demand made upon the exporters to insure our people from the dangers incidental thereto. Would not the public press do a good work by calling general attention to the importance of this matter? Efforts similar to those so successfully used to prevent the introduction of Asiatic cholera would do much good in guarding our people against this fatal malady—anthrax.

WELL-DESERVED RECOGNITION.

It is gratifying to read in many foreign journals and publications reference to and acceptance of the results of original investigation as to the character and causes of many of the infectious and contagious diseases of live-stock made by such zealous and able workers as Drs. Theobald Smith and Cooper Curtice, of this country, and we are surely all very greatly indebted to these contributors in so great a measure to American veterinary literature.

Our Bureau of Animal Industry has been especially fortunate in having among its corps of workers Drs. Salmon, Smith, Curtice, Moore, Hassall, Kilborne, and others.

SHOULD NOW RECEIVE CONSIDERATION.

THE recent experiences noted at Kirk Park, New York, and at Carnegie, Pa., trotting-tracks, where horses were directed by the judges to finish the race in the face of protests of the owners of said animals, who wished to withdraw them because of their unfit physical condition for such trials, and where in both instances death of very valuable animals followed, awakens a new thought and suggests a new field of employment for veterinarians. In all such cases an unbiased veterinarian, not connected with the track or interested in the races in any manner, should have been summoned and his decision in this matter been final. A careful physical examination of these animals would, no doubt, have determined their condition, and their lives have been prolonged had they not been compelled to finish the races. It would be well for all true lovers of horse-racing to consider the urgent necessity of providing for just such cases as these in the prompt selection of reputable and equipped veterinarians to decide matters, and thus render justice to all concerned, without imperilling valuable property unnecessarily.

MARRIAGES.

ON Tuesday, August 31, 1897, Dr. Jacob Helmer and Miss Martha E. Shoemaker were married at Syracuse, N. Y. Dr. and Mrs. Helmer will be at home at No. 311 Spruce Street, Scranton, Pa., after October 1st.

REVIEWS.

BULLETIN No. 64, OF THE VIRGINIA AGRICULTURAL EXPERIMENT STATION.

THIS bulletin is prepared by Veterinarian E. P. Niles, and gives a concise account of the parasitical diseases of sheep in Virginia. As these lower forms of life cause very heavy losses by death and shrinkage in value to the sheep-owners and raisers, it is of the utmost importance to spread general information about them, so that precautionary measures may be adopted, so far as possible, to lessen the burdens to flock-owners. Veterinarians will find in many of these bulletins very useful information about these forms of diseases, and they should, as far as possible, possess them, and thus keep better posted on the nature, extent, and better methods of dealing with these scourges.

DEPARTMENT OF AGRICULTURE REPORTS. The Twelfth and Thirteenth Annual Reports of the Bureau of Animal Industry.

THIS volume contains so much of interest to the veterinary profession, so much of importance to the welfare of the live-stock interests of our country, that we had hoped ere this to have had it more thoroughly reviewed by one of the staff contributors to the JOURNAL.

A glance at its contents will give at once an impressive idea of the great scope of work of the Bureau, and its well-trained experts afford a valuable and complete review of the existing contagious and infectious diseases of live-stock during the past two years, with a *résumé* of the progress made in their better control and eradication. The live-stock interests of our country have had much in the past to thank the Bureau of Animal Industry for, and the real value of its investigations and work grow more forceful each year. To this department, which gives so large a return of real value to those of our people engaged in agriculture, there should be the

freest helping-hand given to enlarge and make more effective the benefits to be derived from this work, which appeals so directly to the welfare of 55 per cent. of our people and indirectly to the entire 73,000,000 of people within our borders.

EXERCISES IN EQUINE SURGERY. By P. J. CADIOT, Professor of the Alfort Veterinary School. Translated by A. W. BITTING, D.V.M., Veterinarian to Purdue University and Agricultural Experiment Station. Edited by Prof. A. LIAUTARD, M.D., V.M., Dean of the American Veterinary College. Published by William R. Jenkins, No. 853 Sixth Avenue, New York City.

WE wish that such an act would become a fixed custom in our country as the one performed by Dr. A. W. Bitting in presenting as a thesis at the close of his college career this worthy translation of *Exercises in Equine Surgery*. The veterinary profession and English veterinary literature would be so greatly enriched by such additions as this as soon to lead to more of our own very able men becoming writers. This work, so well known and highly appreciated among the students and busy practitioners of France and many parts of Europe, is so complete and so valuable in the field it covers that no American veterinary surgeon will want to take up any of the many equine surgical operations without reviewing for a moment the ever-thoughtful suggestions and reminders contained in this book. Fully illustrated, and added to by the editor, Prof. A. Liautard, it comes to us in a thoroughly acceptable style and attractive form, made so by that long-experienced veterinary publishing house of W. R. Jenkins, of New York, that has produced from its presses so many valuable contributions to veterinary literature. We are sure this will prove one of the most sought-for books ever issued by this house.

The Veterinary Blue-Book of New York County and of veterinarians in the United States is now announced for publication in October next. Any changes of addresses or positions are asked for by the Chairman of the Publication Committee, Dr. Rush S. Huidekoper, who may be addressed until September 30, 1897, at Weaver Avenue, Newport, Rhode Island.

The Chicago Live-stock Exchange annually expend \$1800 to inspect and control actinomycotic cattle coming into their yards.

CORRESPONDENCE.

EDITORS JOURNAL OF COMPARATIVE MEDICINE, ETC.:

It seems to me that one of the requisites for the attainment of that high standing which all devotees of the profession of veterinary medicine desire for it is a uniformity of the degrees conferred by the schools.

It is doubtless of value to the practitioner of human medicine that almost everyone knows the significance of the M.D. which the graduates in that profession are permitted to attach to their names. The graduates in veterinary medicine should be accorded a similar benefit.

At this time there are in America almost as many varieties of degrees as there are colleges. Only the specialist knows the import of the letters which are appended to the name of the graduate of veterinary medicine. This is unfortunate.

It is not my purpose to enter into a discussion of ways and means, but to leave the matter with the profession, begging leave to suggest that it would be a fit topic for consideration at the meeting of the Association at Nashville in September.

Yours sincerely,

JOHN J. REPP.

University of Pennsylvania.

CONTROL WORK.

Minnesota. The State Board of Health, under the directorship of Dr. M. H. Reynolds, has just issued some placards especially designed to curtail the ravages of hog-cholera, glanders, and such diseases as are dangerous to the public welfare. They are to be used as a quarantine against the spread of the infection and prevent the introduction of other hogs or horses on the infected premises until after the pens and stables have been subjected to a thorough disinfection in a way satisfactory to the local boards of health, and, in the case of hog-cholera, no other hogs are allowed on the premises until six months after the last hog has died or recovered.

The authority quoted on the placards is chapter No. 233, laws of 1897: "Authority is hereby given to the State Board of Health

and to the several local boards of health of the towns, villages, and cities of this State to take all steps they may severally deem necessary to control, suppress, and eradicate any and all contagious diseases among any of the domestic animals in this State, and to that end said boards are hereby severally empowered, within their respective jurisdictions, to quarantine any domestic animal which is infected with any disease or which has been exposed to infection therefrom. Any person violating any provision of this act or any rule or regulation made by the State Board of Health, or any order made by any such board under the authority hereof, shall be guilty of a misdemeanor, and be punished by a fine of not less than \$25 or more than \$100, or by imprisonment for not less than thirty or more than ninety days."

There has also been a special notice card issued for the safety of owners, to create a private quarantine against carelessness in neighbors or others during the prevalence of an epidemic.

The rules for controlling hog-cholera in Minnesota are as follows:

Rule 1. The following counties were more or less generally affected with hog-cholera during 1896 and 1897 up to date, and are hereby declared an infected district and designated as district "A:" Brown, Watonwan, Martin, Freeborn, Faribault, Blue Earth, Nicollet, Le Sueur, Waseca, Hennepin, and Ramsey, excepting the State Fair grounds. This district is subject to such modifications as the State Board of Health may see fit to make from time to time.

Rule 2. All that portion of the State not included in district "A" shall be known as district "B."

Rule 3. Shipment of swine from any portion of district "A" to be unloaded in district "B," and all other movements of swine, whether they be driven on foot or hauled in wagons from any point in district "A" into district "B," are hereby prohibited.

Rule 4. All shipments from points outside of this State to be unloaded within this State are prohibited, excepted as provided in Rule 5.

Rule 5. Hogs shipped from any other State into Minnesota must be crated, shipped in other than stock-cars, and accompanied by a certificate signed by a veterinarian or physician that they are free from the disease when shipped and come from an uninfected district.

Rule 6. Hogs shipped from point to point in district "B" must be crated and shipped in other than stock-cars.

Rule 7. All outbreaks of suspected hog-cholera in district "B" and in such places as may be deemed practical in district "A" shall be rigidly quarantined.

Rule 8. Shippers of hogs from point to point in district "A" shall be required by the railroad agent to sign a statement to the effect that such hogs are for slaughter only, and within five days after reaching destination. Railroad agents should preserve all certificates demanded by these rules for the protection of their companies in case any shipment of hogs should be followed by an outbreak of disease.

Rule 9. All exhibitions of swine at county fairs in district "A" are hereby forbidden.

Rule 10. All cars in which hogs are shipped into or through this State shall be constructed so as to prevent the escape of manure and litter.

These rules shall go into effect August 20, 1897, and continue in force until altered or annulled by the State Board of Health.

N. B.—These rules do not interfere with any shipments of swine for slaughter into any stockyards of the State that may be located within district "A," and these rules are so framed that the large markets of the State are located within district "A."

Statistics recently computed by the Pasteur Vaccine Company relative to the vaccination of cattle against blackleg in this country for the two years ending June 30, 1897, covering some 75,000 head of cattle, among which the previous annual mortality had averaged 10 per cent., show that since the adoption of the use of vaccine the mortality has been reduced to one-third of 1 per cent., resulting in a saving, on a conservative estimate, of \$100,000. This work has covered sections of South Dakota, Wyoming, Nebraska, Colorado, Kansas, and Texas, and corroborates the results obtained in Europe prior to its introduction in this country. As this is the only remedial hope for these animals, situated as they are, remote from environments that would permit of successful treatment in times of enzoötic and epizoötic outbreaks—and even this plan of protection is accomplished only by arduous labor and difficulties—it is very gratifying to know that we are rapidly attaining effective measures for even the saving of these yearly losses.

The Kentucky authorities are looking after the stud licenses in that State. This is regulated by the highest fee received for service.

LEGISLATION.

California. This State has issued a little pamphlet giving the State pure-food law which passed in 1895; also the ordinance concerning contagious diseases, which is entitled "An ordinance concerning contagious or infectious diseases in animals and the sanitary conditions of dairies, slaughter-houses, markets and other places from which the food-supply is distributed; regulating the sale of cheese, butter, milk, and other products of cattle; providing for the inspection and branding of dairy cattle within the county of Santa Clara; the condemnation and killing of cattle affected with a contagious or infectious disease; prohibiting the disposal of cattle so condemned; prescribing certain duties of the veterinary inspector and health officer of that county, and providing for a punishment for a violation of its provisions." The details of this ordinance provide that the inspector is authorized to inspect all animals within the limits of the county of Santa Clara, and if necessary to condemn such animals if they are afflicted with any disease injurious to human life. After he has done so, he has the right of demanding those animals for destruction, and it shall be considered a misdemeanor for the owner to refuse in any way to accede to his request. The inspector also overlooks the dairies and all stock used for food-consumption. It is also necessary under this ordinance for all receptacles intended for the use of dairy products to be labelled concerning the contents, and also whether the dairy from which it came has been inspected or not. An ordinance entitled "An ordinance to regulate the private inspection of cattle with a view of ascertaining their pathological condition within the county of Santa Clara, State of California," is also included in this pamphlet, and relates to the inspection of cattle by other than the veterinary inspector. The tuberculin must be submitted to the veterinary inspector, however, before the same can be used. The inspection must be held with the knowledge of the inspector, and the notice must be in writing and served at least forty-eight hours before the day stipulated, and he is compelled to be present either in person or by deputy and to brand the cattle so inspected. He has the privilege of rejecting the inspection if he deems it advisable to do so. The ordinance creating the office of veterinary inspector and health officer, and prescribing his powers and duties, provides for the appointment of this officer, who holds

his office at the pleasure of the supervisors. He is empowered to remove nuisances and to look after the inspection and sanitation of such affairs as come within his jurisdiction.

EXAMINATION QUESTIONS.

OHIO STATE BOARD OF EXAMINERS, 1897.

1. Name the muscles surrounding the femur of a horse, give their point of attachment and their point of insertion, and state their action; also state what muscles are inserted to the superior and inferior trochanters. 2. Describe the pneumogastric nerve (nervus vagus). 3. Name and describe the metatarsal bones of an ox (from tarsus to toe). 4. Describe the stomach of a horse and give its position when full of food. 5. Describe the process of digestion in a ruminating animal; follow the food from mouth to anus, and state the changes it undergoes. 6. What forces are acting in effecting inspiration and expiration? 7. Describe the characteristic histological structure of the kidneys. 8. Give the natural history, as far as known, of *sclerostomum equinum* (*strongylus armatus*); state how, and in which way, it produces injury to its host and may become the cause of disease. 9. State the source, and explain the cause, of the development of abnormal degrees of temperature in feverish diseases. 10. Name, and briefly describe, three poisonous umbelliferæ growing wild in the United States. 11. What is "heaves?" Give a definition. 12. Describe the essential symptoms and also the characteristic morbid changes of (contagious) pleuro-pneumonia of cattle, particularly state the differences between this disease and bovine tuberculosis. 13. Give a brief description of distemper (also called strangles) of horses; give all the characteristics, state the cause or causes, and briefly delineate a rational treatment. 14. If in a slaughtered animal, a steer for instance, you should find that in the bones, particularly in the femur and humerus, the narrow and the more porous parts abnormally red, and the marrow spaces and canals enlarged, what would be your diagnosis? Would you condemn the meat or not? 15. Give the characteristic symptoms of spavin, and state the means by which a diagnosis can be secured. 16. Give the various methods of treatment applied to an umbilical hernia; state your preference and give reasons therefor. 17. How would you treat

an inveterate or neglected case of fistulous withers? 18. State the effect of tartar emetic upon our various domestic animals. 19. Describe the symptoms of arsenic-poisoning, and give the treatment you would apply if called in time. 20. State the pharmacognostic properties of aloes, the essential difference between the principal kinds in the market, and their effects upon our domestic animals, particularly horses. 21. What is a bacterium? What a bacillus? What a micrococcus? What is meant by a pathogenic bacterium, and what by a saprophytic bacterium? What by an aërobic, and what by an anaërobic bacterium? 22. What different means may be employed to secure the diagnosis of glanders, and which is the surest and most reliable? 23. How would you proceed in a case of obstetrics if there are twin calves, one with a posterior and the other with an anterior presentation, and both equally far advanced? 24. If a cow has not cleaned in due time after calving, what would you do and how would you proceed to remove the afterbirth? 25. How would you shoe a horse with pumiced feet and convex soles? 26. Suppose you should be called upon to select a saddle-horse for a wealthy gentleman weighing 175 pounds, a good horseman, and desirous of getting a horse that possesses speed and endurance, what kind of a horse would you select? State particulars (so-called points) you would demand. 27. At what age appears the roundish form ($4\frac{1}{2}$ to $4\frac{1}{2}$) in the friction-surface of the middle teeth of the lower jaw of the horse, provided the incisors are of normal length? 28. Suppose a hog is butchered and is found to be trichinous, all the trichinæ are encysted and a deposit of lime-salts has taken place in some of the cysts, while others are not only free from lime-salts but also from fat-cells at their poles, how would you account for the difference, and how long must it be since the animal became infected? 29. Describe the characteristics of a thoroughbred horse. 30. Describe the characteristics of a short-horned cow.

Veterinarian Knowles, of Montana, fully alive to the various duties of his position, has been investigating the cause of death of a number of cattle and sheep, and finds larkspur or wolfsbane, a species of aconite, sometimes called monkshood, botanical name delphinium. In a circular letter bearing upon the subject he forcibly reminds the interests involved that owners of live-stock and organizations connected therewith must lend a helping and encouraging hand in this work for the best results.

SOCIETY PROCEEDINGS.

COMING MEETINGS.

THE PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION will convene at Franklin, Pa., September 21, 1897.

Mayor Jobson, of Franklin, Vice-President of the Association, will welcome the members and delegates, and confer upon them the freedom of the city.

Every active veterinarian in Pennsylvania should attend this meeting.

All should come and hear President Rayner's address, with references to the early history of the profession in the Keystone State.

State Veterinarian Pearson will speak upon the future work of the profession, and how far legislation may conserve these interests.

Secretary Rhoads will, in his report, outline the work done, the duties of the members, and how far they will contribute to the success of his administration by their aid.

We have heard the name of Dr. Francis Bridge suggested for Treasurer, and a first-class officer he would make, to succeed our late Treasurer, Dr. John R. Hart.

Reports of interesting and instructive cases will be afforded those present by Drs. Noack, Harger, and Allen.

Papers of great practical interest by Drs. Jobson, McCray, Pearson, and Hoskins will furnish material for much thought.

There are a large number of good veterinarians in the northwest, central west, and southern tier of counties whose names should be enrolled as members, and they should be at Franklin on the 21st to aid in the work for a stronger organization.

Every arrangement has been completed by the local committee: a suitable hall, special hotel accommodations, visits to the great breeding establishments near Franklin—everything to make you welcome and add to your enjoyment.

These semi-annual meetings afford us the only opportunity of visiting sections of our State where we can enlist strong sectional support and enlarge our membership; for this reason, every old member should be at his post and contribute his share of the work.

There are not enough members yet who never miss a meeting. This number is composed of the busiest men in the profession, and you should be among them. It is a roll of honor.

"Why we visit Franklin?" may interest and afford you some food for afterthought and consideration.

You want to go to Franklin and get acquainted with the new officers. You want to be in touch with Secretaries Rhoads and Helmer.

The JOURNAL can only tell you in October a brief part of the work at Franklin. You want to hear it all, and add your mite.

THE NEW YORK STATE VETERINARY MEDICAL ASSOCIATION will convene its eighth annual meeting September 14th and 15th. Are you going? Syracuse, N. Y., has been selected.

The programme is more than interesting, and contains names that attract by their reputation.

Dr. Roscoe R. Bell will deliver an interesting paper on "Infectious Catarrhal Fever of Horses."

Professor James Law will suggest how to best prepare contagious products for shipment.

Dr. W. L. Williams, whose frequent contributions to the JOURNAL are always interesting, will read a paper on "Caudal Surgery."

The rest of the programme is equally as good, and all those who attend will find themselves well entertained.

It is incumbent on every member to give voice to his opinions in the revision of the By-laws, especially those touching the conditions for membership and the increasing of the annual dues.

Two questions of interest are to be presented for discussion: "That the Department of Agriculture Should Have Full Control of the Suppression and Eradication of Tuberculosis and Glanders," and "Would it be Practical and Economical to Create and Maintain the Office of State Veterinarian?" Such questions are vital, and should have the careful consideration and expression of every New York Veterinarian.

The excuse "too busy" is not worth while considering when it comes to association meetings. The most interested are the busiest practitioners, and they are the ones who always find time to attend.

Secretary Morris has labored unceasingly to crown the meeting with success, and he should be aided by every member of the Association. Your interest can be best assured by your presence at the meeting; your aid can be best volunteered by your contributions, however small, to its success.

THE KEYSTONE VETERINARY MEDICAL ASSOCIATION, of Philadelphia, will inaugurate its winter series of meetings on the evening of September 14, 1897, at the hall, northwest corner of Broad and Filbert Streets.

It is expected that Dr. James Johnston will address the meeting on the subject of laws for the compulsory examination of food-products, and what are found as evidences of its need by meat-inspectors.

Dr. James T. McAnulty will briefly outline the future work of the school of farriery.

Dr. Pearson will give a five minutes' talk on the colleges and their sessions for 1897.

Report from the delegates to Nashville will be presented and be fruitful of much interest.

What we hope for at Franklin, Pa., a week later, will be of additional importance. The selection of delegates for this meeting will be decided.

Many other matters and plans will be considered, all of interest to every local veterinarian.

You will be welcomed, whether a member or not.

U. S. V. M. A. With Boston, Mass., Helena, Mont., and Omaha, Neb., in the field for the meeting of 1898, surely there will be rivalry enough to make the race interesting and entertaining; surely the most sanguine members of ten years ago could hardly have hoped for such progressive changes in the National Association. So much for good officers. What will the next ten years' progress exhibit? Who will prophesy?

VETERINARY ASSOCIATION OF THE DISTRICT OF COLUMBIA.

THE fourteenth meeting of the Association was held at Elks' Hall, No. 1006 E Street, N. W., July 31st, at 8 P.M. In the absence of the President, the Vice-President, Dr. Buckingham, called the meeting to order. The following members answered the roll-call: Drs. Barton, Buckingham, Turner, Walmer, and Robinson, C. B. Dr. Yetton, an applicant for membership, was also present. A letter was received from Dr. C. F. Hadfield expressing regrets that he would be unable to attend the meeting.

The Committee on Credentials made a favorable report on the applications of Drs. Salmon and Yetton for membership, and on motion of Dr. Robinson they were elected members of this Association.

The Legislative Committee reported that no active measures had been taken regarding the bill to regulate the practice of veterinary medicine in the District of Columbia at the extra session of the Fifty-fifth Congress, for obvious reasons, but that a vigorous effort would be made at the coming session in December.

The subject of rabies and its existence in the District was discussed in its many phases, and the Association resolved itself into a committee of the whole, and drafted the following resolutions, which were ordered to be forwarded to the Commissioners of the District of Columbia:

WHEREAS, This Association recognizes rabies as a disease, and that it exists at present in the District of Columbia among the lower animals and man, and that we as a body have recognized this enzoötic disease in a large number of animals, particularly dogs;

WHEREAS, We believe this disease is increasing in this District, and while we recognize that there is no cure for it after the disease is developed, we firmly believe that the disease can be prevented by proper sanitary measures; therefore, be it

Resolved, That this Association recommends to the Honorable Commissioners of the District of Columbia that all dogs running at large during the months of June, July, and August, be required to wear a proper muzzle, and that all unmuzzled dogs be considered dangerous to the health and welfare of the public, and that they be treated as unlicensed dogs and impounded, and that a copy of these resolutions be forwarded to the Honorable Commissioners of the District of Columbia.

Dr. Robinson reported a very interesting case of rabies affecting a mule. The points of interest in the case were the vicious attacks by the teeth made on anything which it encountered, and the fact that the animal moved in a straight line from one side of the corral to the other.

Dr. Buckingham cited several cases of rabies which had existed among the wolves at the Zoological Garden.

Dr. Barton reported several cases of dumb rabies.

For the next meeting (September 25th) it was agreed that the subject of tuberculosis should be discussed in its various forms, each member discussing it in one of its peculiar relations to the public health.

The meeting was then adjourned.

J. P. TURNER,
Secretary.

CHICAGO VETERINARY SOCIETY.

JULY 8, 1897, owing to a quorum not being present, no meeting was held.

August 12, 1897, meeting called to order by President Walker. On motion, roll-call was dispensed with. Seventeen members were present. The minutes of the June meeting were read and approved. The application for membership of Dr. C. G. Gruner was presented, and after examination by the Board of Censors, Dr. Gruner was elected to membership.

The Treasurer's report showed \$24.32 in the treasury. No report from the Secretary.

The Legislative Committee (Dr. Hughes, chairman) reported that the committee called upon Dr. Reynolds, of the City Health Department, in regard to establishing a meat- and milk-inspection in this city, which would be under the control of veterinarians. The committee was excellently received by Dr. Reynolds, who referred the committee to the Civil Service Commission. The latter, after hearing the desires of our committee, fell earnestly into our ideas, and promised that positions that should be filled by veterinarians should be filled by no one else, and also that the present quack city veterinarian to the Police Department would not continue to hold his position longer than for them to find an eligible practitioner. And further, that within three weeks an examination of members of this Society desiring city positions would be held for the purpose of finding competent men.

Moved by Dr. Henderson, seconded by Dr. E. L. Quitman, that the Secretary write the Civil Service Commissioners and ascertain the exact date of such examinations, and also sincerely thank them for their kindness in their reception of our committee and to our Society as a whole; voted and carried.

Motion by Dr. E. L. Quitman, seconded by Dr. Hawley, that this Society hold its November meeting on one of the days of the annual meeting of the Illinois State Veterinary Medical Association, and that the Literary and Publication Committee produce at least two papers for presentation to the Society on such occasion; voted and carried.

Motion by Dr. Robertson, seconded by Dr. Allen, to dispense with the regular order of business (no paper being presented), and to hear reports of unusual cases from any member present who may desire to state same.

Dr. E. L. Quitman related two cases to show the efficacy of potassium iodide and iodine in paralysis:

CASE I.—Cocker spaniel, male, five or six years old; chronic constipation present. Paraplegia symptoms. These were so severe that the hindparts were dragged. A cathartic was given, with good responsive action, but no improvement of the paralysis. Strychnine in doses of one-ninetieth to one-thirtieth grain were given for two months; no improvement. Iodide of potassium and resublimed iodine were given, with great improvement in eight or nine days, and an entire cure in three weeks.

CASE II.—Horse down in stall and unable to rise at first; later with aid stood up, but was unable to handle hindquarters properly. Strychnine was given, with no improvement. The case became worse. Would walk three or four steps and fall. Substituted the following: R.—Iod. pot., 3j; iod. resub., gr. xv. Sig.—M. in sol., t. i. d.; and blistered the spine. Entire recovery in three weeks.

Moved by Dr. Hughes, seconded by Dr. Campbell, that the Society give a vote of thanks to Dr. Quitman; carried.

Dr. Hughes reported that the potassium-iodide treatment was recommended in the Royal College very highly, and that he had made successful treatment with it when strychnine had failed.

Dr. Robertson mentioned a case pending in court where a great controversy took place over the recovery of a supposedly stolen dog. Great diversity of opinion by experts was in evidence as to the dog's age (the age being conclusive as to ownership), and the Doctor wanted to know if any of the members present think the age of a dog can be determined by the teeth after the age of one year.

Dr. Hughes said that at the Royal Veterinary College students were expressly instructed not to try to tell the age by the teeth, as it was very risky and, in Dr. Hughes's opinion, a very doubtful proceeding; for his part, he would rather depend on the actions, antics, and appearance of the different breeds, rather than by the teeth.

Dr. Robertson held that in his opinion the age could not be told after one year, and never omits, when asked, to say that he does not know the age and cannot tell.

Dr. White stated that in his opinion dogs with even jaws can be approximately told after experience and careful study up to five years old.

Dr. Worms relies on the tartar and color of the teeth; he thinks more and more tartar and more yellowness, especially of the molars, occur year by year, and careful observation of this is some indication.

On motion, the regular order of business was recalled, and on motion the meeting adjourned.

L. CAMPBELL,
Secretary.

COLORADO STATE VETERINARY MEDICAL ASSOCIATION.

THE regular semi-annual meeting was called to order at Denver by Dr. Sol. Bock, President, in the chair, July 22, 1897. The following members answered to roll-call: Drs. Solomon Bock, F. M. Hunt, Emil Pouppirt, of Denver, and Dr. D. P. Frame, of Colorado Springs. Dr. Charles Lamb, of Denver, came in later. Dr. M. R. Trumbower, of the U. S. V. M. A., was present as a welcome visitor. Minutes of the last meeting were read and approved.

Dr. Frame made a verbal report of the progress and result of the proposed veterinary bill in the last Legislature. The bill was reported favorably by the committees of both branches of the Assembly, and was on the calendar for passage, but was not reached in time for action.

The applications for membership in the Association of M. J. Dunleavy, M.D.C., of Chicago Veterinary College, and Dr. E. Bovett, were presented by Dr. Bock, and seconded by Dr. Hunt. They were elected to membership.

A letter from Dr. A. T. Peters, of Lincoln, Neb., was read, requesting the influence of this Association in securing the next annual meeting of the U. S. V. M. A. in the West. The Secretary was directed to reply to this, assuring Dr. Peters of our support.

Dr. E. Bovett came in and was introduced to the members present.

Dr. Pouppirt nominated Dr. Lamb for Treasurer of the Association; seconded by Dr. Hunt. Dr. Lamb was elected Treasurer.

Dr. Charles Gresswell, the regular essayist for this meeting, being absent, the members indulged in a general discussion of rare and interesting cases, with treatment of the same, and in this way spent a very enjoyable and profitable afternoon.

The next meeting will be called January 4, 1898. Adjourned to meet at that time.

Colorado Springs, Col.

D. P. FRAME, M.D.C.,
Secretary.

AMONG THE COLLEGES.

UNIVERSITY OF THE STATE OF NEW YORK.

The regents of this college include Hon. Frank S. Black and T. L. Woodruff this year, in place of Levi P. Morton and Charles T. Saxton of last year. Chester Lord is also on the list as succeeding William L. Bostwick of 1896. Frederick A. Putnam has been dropped from the Board of Censors. Dr. Wilfried Lellman has accepted the post of professor of materia medica in addition to the professorship of parasites and parasitic diseases, and Dr. Charles B. Fitzpatrick has been included in the faculty as lecturer on bacteriology. Drs. Goldstein, Cook, and Horpel are no longer among the faculty. For matriculation a student must present a regents' veterinary student certificate, representing at least forty-eight academic counts; a baccalaureate degree from the academic department of a college or university of recognized standing; an academic diploma granted by the regents of the University of the State of New York, or satisfactory proof of having done work considered by the regents as equivalent to the above. Those matriculants who cannot fulfil all the above requirements must pass the regents' examination before the beginning of the second year. Glass's translation of Müller's *Diseases of the Dog* has been added to the list of text-books of this college.

HARVARD UNIVERSITY.

The vacancy in the Governing Board for 1900 has been filled by the selection of George Frisbie Hoar, LL.D., Worcester. Dr. Ogden is one of the recent instructors in chemistry. One of the unusual features at Harvard is that in the course the clinical exercises are given by different instructors, thus doing away with the

serious objections arising from the instruction being given by one man, however good he may be.

LOUISIANA STATE UNIVERSITY.

The announcement for 1897-'98 of the Louisiana State University and Agricultural and Mechanical College at Baton Rouge informs us of the return of Dr. W. H. Dalrymple to the chair of veterinary science. We note the existence of a commodious veterinary hospital in connection with the school, and that veterinary science is a part of the curriculum of the junior and senior classes in agriculture, embracing the anatomy, physiology, and pathology of the different systems of equines and bovines as well as diseases, obstetrics, orthopedic surgery, dermatology, and helminthology.

THE UNITED STATES COLLEGE OF VETERINARY SURGEONS.

The announcement for this year shows a change in the chair of dental surgery, Dr. William E. Yetton having succeeded Dr. Andrew C. Seacord in this department, and also on the hospital staff. The college has also very materially extended its list of qualifications for the degree of fellowship. In addition to the previous requirements, the applicant, if a graduate from a medical school, must have done some research-work in comparative medicine which has been of value to the veterinary world. He must submit a thesis on a new subject to have sufficient merit to be accepted by the college, and to be used by them in the compilation of a work on veterinary science. He is required to fill out an application blank, which will be furnished on application. The sum of ten dollars as an initiation fee will be charged, the money to be used in paying for the publication of these theses and the compilation of them into book-form, each Fellow of the college to receive a copy free of charge. This is done that the college may be able to compile a work that will be of great use to the profession, in that it hopes thereby to secure reports of practical experiments instead of theories which prove of but little consequence when applied to practical work.

VETERINARY DEPARTMENT, COLUMBIAN UNIVERSITY.

The Hon. Edwin Willits has been dropped from the Faculty and Drs. Victor A. Norgaard and David McMaster added; also Dr. William H. Bolyn. Dr. Glass's translation of Dr. Müller's *Diseases of the Dog* has been added to the list of text-books.

KEEP YOURSELF POSTED ON CURRENT EVENTS.

Twenty-eight horses have recently been destroyed in Indiana suffering from glanders, said to be from cheap horses brought in the State and sold to farmers. The State Live-stock Sanitary Commission are investigating the condition of horses in several localities.

Another one of the schemes recently adopted to give notoriety by a veterinary surgeon in a large city consists of a large, illuminated blotting-pad, with the picture of an ambulance and flying horses. What next?

In the Massachusetts volunteer militia regulations there is a clause referring to the duties of veterinary surgeons of each brigade, which reads as follows: "They will thoroughly inspect all horses reported for duty, and they are authorized to reject horses unfit for service and order that they shall not be returned for allowance on bills or pay-rolls. If possible, they will inspect the horses for artillery and cavalry prior to their leaving their home posts. If it is necessary, in order to accomplish this, to have the duty performed the day before camp, the veterinary surgeons will perform this duty on those days and be returned on pay-rolls for extra duty."

Lieutenant-colonel and Medical Director Clark, of the First Brigade, in his report (Public Document No. 7, 1897) to the Adjutant-General of the Massachusetts volunteer militia, speaks of the hospital facilities afforded by First Lieutenant and Veterinary Surgeon Osgood for the accommodation of sick and disabled horses used for military purposes. Surgeon-General Blood further recommends for the benefit of the service that Lieutenant F. H. Osgood, veterinary surgeon of the First Battalion and Artillery, and Lieutenant Austin Peters, First Cavalry, should be promoted to the rank of captain and attached to brigade headquarters.

Lincoln, Nebraska, is building a sheep-dipping vat capable of treating 10,000 a day. A triple swim a distance of ninety feet and a two-minute period in the dip, with very ample covering sheds to dry off in, are the complement of requirements. Sheep-owners will have their choice of any of the approved sheep-dips.

Yvette, the pet cocker-spaniel bitch of Mrs. Finlay Anderson, the novelist, is dead. Her owner will prepare for print a biography of the animal, that her memory may be better preserved among those who had not the privilege of her acquaintance.

Alaska will have established shortly within its borders an agricultural experiment station. The sum of fifteen thousand dollars has been appropriated for this under the Hatch law establishing these stations.

An important contribution at Nashville will be by Dr. Veranus A. Moore, of the Bureau of Animal Industry, on "A Cause of Death among Swill-fed Pigs, based upon Experiments." As this is a very important subject among the boards of health of all large cities, it is sure to awaken a deal of interest among all city inspectors.

Boards of health having veterinarians on their staff of officers should see that these members be sent to the annual conventions of the United States Veterinary Medical Association, where are considered so many vital questions relating to the field of their work.

Draught-horses in Chicago sold in August as high as \$190 a piece. They are reported scarce, and orders are difficult to fill. An Ohio newspaper was shown the editor of the JOURNAL in August, quoting the sale of a heavy draught-horse for \$146.50, which could have been bought by a dealer at less than \$100 sixty days prior.

The *Weekly Picayune*, of New Orleans, of August 26th, gives a hearty welcome to the first meeting of the U. S. V. M. A. in the South. It goes farther in the education of the public of our mission to the South in a brief review of the work it is doing, its high standing among the learned professions, and reference to the excellent class of professional members of which it is composed. Surely with such greetings as this we must all feel a high sense of honor when numbered among its membership.

The department of civil service will conduct examinations on meat-inspection on October 25th at the following places: Montgomery, Alabama; Little Rock, Arkansas; San Francisco and Los Angeles, Cal.; Denver, Col.; Hartford, Conn.; District of Columbia; Jacksonville, Fla.; Atlanta, Ga.; Chicago and Peoria, Ills.; Indianapolis, Ind.; Des Moines, Iowa; Wichita, Kansas; Louisville, Ky.; New Orleans, La.; Portland, Maine; Boston, Mass.; Detroit and Grand Rapids, Mich.; Duluth and Minneapolis, Minn.;

Vicksburg, Miss.; St. Louis and Kansas City, Mo.; Helena, Mont.; Omaha, Neb.; Concord, N. H.; Albuquerque, N. M.; New York, Albany, and Rochester, N. Y.; Wilmington, N. C.; Cincinnati and Cleveland, Ohio; Oklahoma City, Oklahoma; Portland, Ore.; Pittsburg, Philadelphia, and Harrisburg, Pa.; Providence, R. I.; Charleston, S. C.; Sioux Falls, S. D.; Nashville and Knoxville, Tenn.; Fort Worth, San Antonio, and Houston, Texas; Salt Lake City, Utah; Burlington, Vt.; Richmond, Va.; Seattle, Wash.; Parkersburg, W. Va.; Milwaukee, Wis.; Cheyenne, Wyo.

Applicants should exercise the utmost care in specifying the date and place selected for examination, and should make no requests for changes in the schedule. All applications must be on file in the office of the commission on the proper blank forms at least ten days prior to the date selected for examination.

Dr. George Hopkins, of Cleveland, Ohio, reports successful results in tetanus with serum prepared from the blood of goats made immune to tetanus by successive inoculations of the tetanus bacilli.

Formalin is highly commended for the treatment of ringworm. As these are often very annoying in horses and cats, we hope some of our readers will give it a trial and report their experiences.

The use of Sanmetto in azoturia is very highly extolled by Veterinarian F. J. Bliss, of Earlville, Ills., who reports its use in over fifty cases in various stages of the disease with uniformly good results. Its prompt action in cleaning up the characteristic color and offensive odor and abatement of the alarming symptoms of the disease are especially noted, with marked relief to the animals.

At a meeting of the French Academy of Medicine, held in Paris on the 27th of July last, Dr. Nocard stated that the Pasteur laboratories in Paris had dispensed 7000 doses of 10 c.c. each of tetanus antitoxin, which had been used for the preventive treatment of 3100 animals located in districts where tetanus was endemic. Not a single death from tetanus occurred. One horse alone, treated five days after the infliction of the wound, had tetanus, but the disease was mild. During the same time the same veterinarians had observed 259 cases of tetanus in animals that had not been treated preventively with the antitoxin. Dr. Nocard states that there is no doubt of the utility of preventive injections of tetanus antitoxin in veterinary practice. The treatment of tetanus, when once thoroughly declared, is difficult and uncertain. Its prevention, therefore, is of prime importance.

In 1896 the United States exported 491,565 head of sheep, nearly four times the number exported in 1889. Exports of fresh beef, hams, and oleo have all increased in very great proportions.

Illinois has a lien law for registered stallions.

The Government inspection of stallions used for breeding purposes is still being agitated and gaining fresh adherents. The plan suggested that their inspection be carried on by State Veterinary Sanitary Boards or State Veterinary Associations under Government direction seems to meet with much favor.

Providence, Rhode Island, will have a horse improvement association, among many other leading attractions, to stimulate interest in horse-breeding and the ownership of handsome animals.

Two of Erie's leading veterinarians recently came to blows, followed by an arrest and prosecution, the outgrowth of some examinations made of cattle in that district for tuberculosis.

The Chicago Light Cavalry is the latest addition to mounted troops of the "Windy City." Surely the needs of horses are multiplying, and with the higher prices daily prevailing the signs of the times are more promising.

The Mississippi Experiment Station recommends the following application for the homfly: Two parts of fish-oil or cottonseed-oil and one part of pine-tar. Reapply with a brush every three to six days.

Tennessee and Arkansas cattle have been denied admittance to Illinois, on account of Texas fever, by proclamation of the Governor of Illinois.

A "Horseman's Protective Association," with principal office in New York, was incorporated last week at Albany. The objects are the fostering and protecting of the interests of horse-owners, trainers, and jockeys; the improvement of the breeds of thoroughbred horses through trials of speed and otherwise; the settling of differences between members, and the promotion of more enlarged and friendly intercourse among all classes engaged in owning, training, racing, or riding thoroughbred horses.

Dr. N. D. Daddy, of Loett, Indiana, is quoted as having proven conclusively that for driving horses clover hay is as satisfactory for an exclusive diet as it is for work-horses.

A practical device invented by Mons. Zimmerman, of Paris, France, for the prevention of runaways, has already become a

familiar sight on the boulevards of that city. The apparatus is a woven-wire muzzle which extends over the horse's face, just covering the nostrils, and is connected with the reins by stout straps. When the horse becomes excited and attempts to run away the reins are pulled tight, thus causing the muzzle to close over the nostrils and mouth, producing immediate suffocation. A number of vicious horses were experimented upon with the device, and in every instance the animal was almost instantaneously stopped. The only real objection to the apparatus is its unsightliness.—*Spirit of the Times*.

A duty has been imposed on Canadian horses unloaded at Skaguay, Alaska, and it is feared that this action will cause discontent among American miners; but the duty was paid, although under protest. The collector also assumed the duty of appraising the horses according to their value in Alaska.

The *Country Gentleman* quotes Prof. Cottrell, of the Kansas State Agricultural College, referring to the recent reports of tuberculosis made through the public press. It can be tracked back at least to 1880, since which time it has been gradually spreading, though the general health of the herd continued excellent for a dozen years after that date. Tuberculin-tests were begun in February, 1894; but the whole herd was not gone through till last winter, when eighteen out of fifty-two were found affected, and were isolated. A second and more searching investigation is to be made on October 20th. Meanwhile no animals will be sold, none purchased, and no milk used for dairy purposes or for feeding animals.

A million and a half pounds of canned beef was recently prepared and shipped by a Kansas City firm for use in the Japanese army.

The United States is said to have had over forty million hogs at the beginning of the year, Iowa alone having nearly four million.

At last the two-minute record has been broken, and Star Pointer stands to-day king of trotters the world over. 1.59 $\frac{1}{4}$ points the beacon-mark of attainment in the breeding of trotters, and the wonderful strides to this great feat make its attainment all the more to be proud of. Our good friend, Dr. Bailey, of Maine, still lives, and though he had not expected to see this accomplished in his lifetime, we trust that many more years may be his to enjoy, and that the breaking of this record may yet be reached.

Over fourteen million horses within our borders on January 1, 1897. Iowa with over one million, Texas and Illinois a like number, while Rhode Island has but 10,129, with an average valuation of \$75.25 each; Kentucky with 400,879, valued at over \$13,000,000, or \$32.57 per head, while those of Oklahoma are appraised at \$13.40 per head. Texas leads in mules, with 261,428 in number to her credit, while Georgia has the greatest value invested, her 164,380 averaging \$62.95 each. New Jersey averages the value of her mules at \$76.70, while New Mexico only places \$19.15 as the average value. The mules in the entire country are estimated at 2,213,654 and valued at \$92,302,000, or an average of \$41.65. From 1892 to 1897 the value of horses decreased nearly \$600,000,000, while the number fell off only one million.

Another pair of draught-horses recently brought the sum of \$465 at one of the Chicago auction-marts.

A freak of nature has been recently discovered in Kentucky. It is a pony forty inches high and five feet five inches in length. Its head is six inches longer than its neck, and it has a breast like a cow and hips like a hog. It possesses twenty-eight ribs and four stifle-joints, and is double-jointed in all joints. It is four years old and of Norman breed, and weighs 285 pounds. It is owned by Mr. Mason Gordley.

PERSONALS.

Dr. John R. Mohler, of Philadelphia, was transferred on April 1st from El Paso, Texas, to San Diego, Cal., for the inspection of Mexican cattle importations.

Dr. J. H. Ferster, of Brooklyn, fills the post of veterinary editor to the *Metropolitan* and *Rural Home*, as well as the United States Government veterinary inspectorship.

Dr. Raymond Barber, of Doylestown, Pa., has succeeded to the practice of Dr. H. E. Wand, of Newtown, Bucks County, Pa.

Dr. H. D. Gill, of New York, is a frequent visitor to Coney Island, and, with a fast trotter on the road, whiles away many enjoyable hours.

Dr. Harry Walters, of Wilkesbarre, Pa., was a recent visitor to Philadelphia and New York.

Dr. Alexander Glass, of Philadelphia, was the captain of a party who spent some ten days in August along the shores of the Chesapeake Bay.

President F. H. Osgood, of the U. S. V. M. A., was a victim of influenza during the month of August.

Dr. Albert H. Sheldon, of Boston, is an ardent canoeist, and longs for his annual pilgrimage to the streams of the "Pine Tree State."

Dr. H. A. Christmann has changed his location from Chestnut Hill to West Philadelphia.

Dr. S. J. J. Harger was a recent visitor to Canada on a professional mission.

Dr. George H. Bailey, of Portland, Maine, finds much pleasure at his stock-farm at Deering, Maine, where his choice selection of trotting stock attracts many visitors.

Dr. Charles P. Lyman, of Harvard Veterinary College, finds the mountain air of East Jaffrey, New Hampshire, peculiarly beneficial to his health.

Dr. Wesley H. Labaw, of Boston, spent his summer holidays at his home near Princeton, N. J.

President Lester H. Howard, of the American Veterinary College Alumni Association, and family, of Boston, are summering at Clinton, Mass.

Dr. Leonard Pearson was a visitor to the New England coast in August.

A cablegram from Berlin, Germany, brings news of the arrest of Dr. G. Leo Hagen Burger, of Brooklyn, N. Y., on the charge of theft of surgical instruments from one of the hospital clinics he was attending. Some months ago Dr. Hagen Burger sold out his hospital and practice in Brooklyn, ostensibly to take up the profession of law; but we are informed that his sojourn in Europe was for the purpose of fitting himself in some specialty of veterinary science, with a view of returning to take up practice again in this country. Happily the doctor was released by the judge who declared he did not think Dr. Hagen Burger intended stealing the instruments.

The JOURNAL is glad to report the return of Dr. Charles T. Goentner, of Bryn Mawr, Pa., to practice, with the promise of a complete recovery from his recent alarming illness.

Dr. J. C. Shaub, of Lancaster, Pa., was a visitor to the JOURNAL office in August. His summer holidays are spent in visiting distant sections of the country by easy jaunts in his carriage.

Dr. G. Howard Davison, of Millbrook, N. Y., is an admirer of the Berkshire breed of swine, and was among the purchasers at a recent sale of high-class stock.

Dr. W. S. Manley, of Arkansas City, has relinquished practice for a period, and will enter one of the veterinary colleges for a post-graduate course.

Dr. J. T. Crosby, M. R. C. V. S., formerly of St. Louis, Mo., has purchased the good-will and practice of Dr. W. S. Manley, of Arkansas City, and moved to that place.

Dr. D. P. Frame, of Colorado Springs, holds the position of food-inspector for that city under appointment by the health department. His duties cover meat, milk, and dairy as well as the inspection of all other goods.

Mr. Harold Sorby, of the Pasteur Vaccine Company, of Chicago, who has accomplished so much for the introduction in America of the products of the parent company of Paris, France, will be a welcome visitor at Nashville.

Dr. Matthew Wilson, Jr., of Mendota, Ills., has been appointed on the Board of Horseshoers by Governor Tanner.

Dr. W. W. Richards, of the class of '97, of Ontario Veterinary College, has been travelling in the Northwest, but has finally located at San Diego, Cal.

Dr. T. D. Hinebauch, of North Dakota, in connection with his trip to Nashville spent some time in the leading Western cities.

Dr. M. W. Tritschler, of Cincinnati, Ohio, was a visitor to the JOURNAL office in August. He was off for a summer vacation.

Mr. John A. Logan, Jr., will manage the harness and saddle classes at the Chicago Horse Show, November 2 to 13, 1897.

Dr. Robert McKibben has finally located at Parkersburg, W. Va. Dr. McKibben is one of the recent graduates from the veterinary department of the University of Pennsylvania.

Dr. L. Kenneth Green, of Booth's Corners, Pa., has been appointed inspector under the Bureau of Animal Industry and assigned to duty at Buffalo, N. Y.

Dr. A. W. Clement, of Baltimore, was a visitor to the New England coast in August, and was the guest of Editor Gill, of New York, on his way to the eastern shore of Massachusetts.

Dr. Frederick H. Osgood has again received the appointment of inspector of animals and provisions for the town of Brookline, Mass.

Dr. James B. Rayner and wife, of West Chester, Pa., spent a portion of August at Atlantic City, N. J., in the hope of restoring Mrs. Rayner's impaired health.

Dr. C. P. Lyman, of East Jaffrey, New Hampshire, was confined to his bed by illness for a period in August.

Dr. John M. Parker, of Haverhill, Mass., recently met with the misfortune of the loss of his esteemed wife.

Dr. E. E. Bittles and wife, of New Castle, Pa., spent five weeks travelling through the West. Visited seventeen different States and Territories, and found it required but very few veterinarians to supply the wants west of the Missouri River. In San Francisco an Italian is the leading veterinarian.

Dr. Frederick H. Osgood was recently elected an associate member of the Association of Military Surgeons of the United States, the first recognition of a veterinarian in that body.

Dr. J. G. Parslow, of Marshalltown, Iowa, fills the post of secretary to the racing association of that town.

Dr. Eugene W. Sullivan is veterinarian to the fire department of the city of Chicago.

NEW INVENTIONS.

A ball-float, the lever provided with a series of rods or arms of spring-metal, projecting from the lever in different radial directions, curved downwardly, and extended to embrace and confine with a constrictive pressure; the holder of the ball consisting of an inverted cup-shape casting, having an upwardly extended, transversely apertured hub; the edgewise arranged bosses provided with screw sockets.

A horse-cover with a pair of pivoted arms secured to the edges of the neck portion of the blanket, and mechanism secured to the blanket for turning said arms on their pivots.

An automatic cattle-gate for railways, comprising a bearing-block secured to the bottom flanges of the rails, a cam-faced shaft provided with cylindrical journals, the gate-panels and radial arm fixed to said shaft, the weight secured to the arm by the chain, in combination with the platforms, pivoted at one end to the fixed shaft, a chain connecting the shaft and the free ends of the platforms.

The combination with a horseshoe having a depending ledge upon its under side, provided with dovetailed recesses, of a plate fitting with the shoe; lugs upon the upper surface of plate having dovetailed recesses registering with the recesses in the ledge; detachable calks having laterally extending dovetailed tongues adapted to fit within registering recesses, and screws passing through the tongues and lugs.

A horse-checking device operated from the seat of wagon through rods whose ends are arranged to drop in teeth arranged around the hub.

An improved hoof-pad, consisting of two parts of metal interlocking in the centre over the point of the frog.

An ice-creeper shell, carrying calks, and provided near its rear end with an opening through which the heel-calk of the shoe is adapted to pass.

A harness-saddle, comprising a saddle-seat, stems projecting downwardly therefrom, crupper-loop, a skirt for supporting the crupper-loop, and a bearing-strap adapted to move between the saddle-seat and crupper-loop and be guided by the stems.

An apparatus for aligning and starting horses on race-tracks, consisting of a spring-stretched, flexible barrier, having its ends connected to spring-raised brackets, movable in slotted columns, and levers adapted to engage teeth on said brackets, and connected together through bell-cranks pivoted on opposite sides of the track.

A horseshoe with curved calk projecting from lower face of the toe of said body, and an independent L-shaped calk projecting from the lower face of each of the heels; has long edges parallel with the outer edge, and the several calks merge nearby the centre of the shoe.

A checkrein-hook, combination with a post of a hook, the shank being swivelled to the post and provided with a transverse hoop which is adapted to be attached to the crupper-strap of the harness.

A currycomb with rows of teeth connected to back, a cleaning plate having openings through which the teeth can pass ; the shoulders serve as abutments for the back, the coil springs are located between the back and the cleaning plate.

A line or rein-guide or holder, adapted to be connected with the hip-strap of the harness.

A holder for powder-papers, consisting of a base, the guide-posts, the pivoted latch at the upper end of one of the guide-posts, and the spring-actuated table arranged to slide on posts between the nose of the latch and the base.

A veterinary tooth-cutter, composed of parallel roller-bars, formed with sector-gears, each of the bars being provided at one end with a handle and at the other with a cutting-edge and connected by bearing-boxes.

A bridle-bit, the combination with the bit-bar having apertured ends that taper inward from opposite sides of the rein-rings, having opposite conical ends received into the tapering apertured ends of the bit-bar, and means for drawing said conical ends toward each other to tighten them in the bit.

A harness-buckle, the plate having orifices near the ends and the bend, the plate provided with slot, spring, and peg, in combination with a movable hand.

A clinical thermometer, having two distinct chambers formed within the bore of the tube, and a comparatively open contraction between both chambers.

A bandage-cutting machine, with knives and transversely slotted rests adjacent thereto.

A hame-body, formed from sheet-metal blank, condensing the metal at the place of the greatest wear and tear and permitting the body to be formed from a comparatively thin blank.

A cauterizing apparatus, in combination with a burner-tube of a blower-holder, carried by the handle.

A soft-tread horseshoe, the groove tread and band for retaining tread in position, and having its ends held in the groove in the tread.

An equalizer for preventing horses from leaving their feet, the combination with boots of a cord connecting the boots and a guide adapted to be secured against the under side of the body, and held against forward movement.



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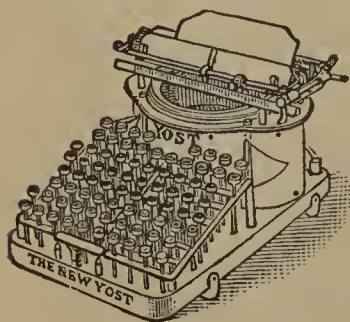
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
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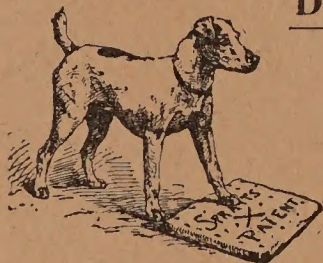
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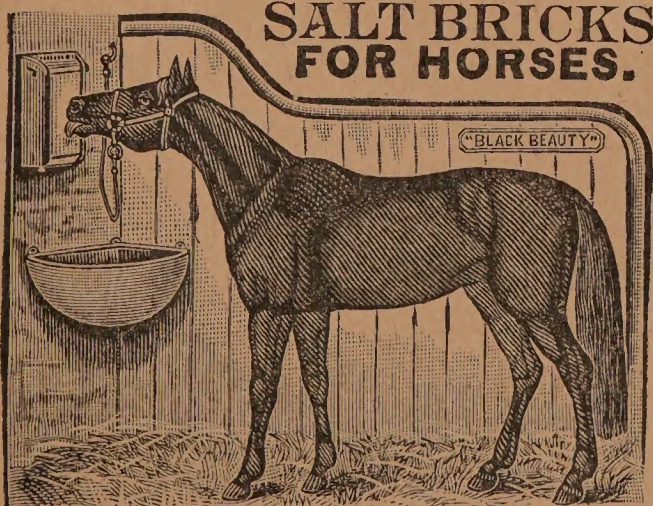


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